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OUTREACH PCI/PMC EXPANSION SYSTEM

USER'S MANUAL

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REVISION HISTORY

Rev	By	Date	Description
1	JL	June 2000	First engineering release.
-	JL	June 2000	Production release. Updated Appendix B to reflect modified PCI-P0 backplane pins. Changed cable requirements in Appendix A as product now uses standard base-card cables. Changed title of document to reflect new tabset. Added J1 JTAG connector information in Chapter 2.
A	JP	November 2001	Updated Chapter 3 to reflect modified PCI-P0 backplane pins. Changed title of document to reflect new OUTREACH system name.
B	JP	June 2002	Improved the explanation on page 1-3 of JTAG support for the CPLD on the PMC-605. Clarified statement on page 1-8 to indicate that when the bus is parked, it is parked on the System Slot. Changed description of PCI System Reset (RST#) signal on page 2-3 to remove dependence on the Busmode1 signal. Removed the Clock Mask section on page 2-4, since the clock signal will now always be present on the PMC sites (dependence on the Busmode1 signal has been removed), regardless if a PMC module is installed. Updated Table 2.6 to reflect pinout changes (signals on P0 connector pins P0-A4 and P0-C4 have been swapped) that were introduced via ECO number 500000000673. This ECO allows smart PMC modules installed on the SVME/DMV-210 to perform DMA cycles back to the host card. Added note on page 3-2 that summarizes which E jumpers on the BPL-605-002 and BPL-605-003 are reserved. Improved Figure 3.2, Figure 3.3, and Figure 3.4 to indicate the correct orientation of the 2 or 3 Slot Development Backplanes and the location of the E-jumper straps. Corrected errors in Table 3.7 (specifically the descriptions of "Clock Source", "Request Line", and "Grant Line"). Corrected error in "Configure Master's Primary BARs" on page 4-9. The Command Register is located at 0x44, not 0x40 as was previously shown. Improved Figure A.3 to clarify how the BPL-605-002 and BPL-605-003 Development Backplane modules need to be oriented for correct operation.
C	JP	June 2004	Updated to correct SVME/DMV-210 P0 pinout table (see Table 2.6 on page 2-11). Updated to correct SVME/DMV-210 P2 pinout table (see Table 2.8 on page 2-13).
D	JP	February 2009	Updated to address CR#26124. See "Install PMC-605 on Basecard" on page A-3 for corrected cross reference to document number 808335.

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PREFACE

PURPOSE

This manual provides an overview of the OUTREACH PCI/PMC Expansion System, which is comprised of the PMC-605 PCI-P0 Bridge Module, the SVME/DMV-210 Carrier Card, and the PCI-P0 Development Backplane. The manual also explains how to install the system and configure the PCI-P0 bus.

AUDIENCE

This document is intended for readers with a technical understanding of hardware engineering fundamentals, as well as an understanding of the VMEbus, PCI, and CompactPCI architectures.

SCOPE

This manual contains the following chapters:

Chapter 1 - PMC-605 Bridge Module. Describes the features, functions, and pin assignments of the PMC-605.

Chapter 2 - SVME/DMV-210 Carrier Card. Describes the features, functions, and pin assignments of the SVME/DMV-210 Carrier Card.

Chapter 3 - PCI-P0 Development Backplane. Describes the PMC-605's PCI-P0 2 and 3 slot development backplanes.

Chapter 4 - System Configuration. Explains how to program the base address registers of the PMC-605 and lists the default contents of the EEPROM device.

Appendix A - Installation Instructions. Explains how to install the Outreach components into a system.

RELATED DOCUMENTS

Foundation Firmware v8.0 User's Manual, CWCEC document #808006. In particular, refer to Appendix A of this document. It describes the Foundation Firmware extensions specific to the PMC-605.

Getting Started with the 21554 Embedded PCI-to-PCI Bridge Application Note. Intel Corporation document #278210-001. Available for download from website at *http://developer.intel.com*.

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CONVENTIONS USED IN THIS MANUAL

This document and the accompanying documents in the documentation package use various icon conventions and abbreviations to make the documents clearer and easier to read. These conventions cover typography for such elements as sample software code and keystrokes, signal meanings, and graphical elements for important information such as warnings or cautions.

Typographic Conventions

Table 1 lists the typographical conventions used in documents contained in this documentation package.

TABLE 1: Typographical Conventions

Item	Convention	Example
Keystrokes	Keys are listed as they appear on most keyboards, surrounded by < > marks. Combinations of key-strokes appear within a single set of < > brackets.	Type < Ctrl-Alt-C > to return to the previous menu. Type < Esc > to exit.
File Names	File names are set in italics.	Open the file named *es.h*.
Directory Names	Directory names show the full directory path. The last directory in the path does not have a trailing slash following it.	Go to the *c:\windows\temp\backup* directory.
Monitor Displays	Prompts and other text appearing on monitors is set in bold monospace type.	**% mpp MC68040gnu** >
Firmware Code	Firmware code, and any information you need to type in response to a prompt, is set in monospace type.	% make -f Makefile.MC68040gnu

Signal Conventions

Table 2 lists symbols that can follow a signal name. For example, the asterisk (#) is used with a PCI signal name, such as IRDY#.

TABLE 2: Signal Conventions

Symbol	Description
[no symbol]	The signal is active HIGH.
# or -	The signal is active LOW.

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Abbreviations

Table 3 lists the abbreviations used to describe the size of a memory device or a range of addresses.

TABLE 3: Abbreviations

Abbreviation	Convention
1 Kbyte	1,024 bytes
1 Mbyte	1,024 Kbytes
1 Gbyte	1,024 Mbytes

Memory Addresses

Unless otherwise stated, all memory addresses are shown in hexadecimal notation.

Icons

The following icons are used throughout this document:

Cross Reference

Cross references to other documents are used when a subject being discussed is addressed in depth by another, more authoritative document. Cross references are also used for document chapters and sections.

Warning

The warning icon indicates procedures in the manual that, if not carried out, or if carried out incorrectly, could cause physical injury, electrical damage to equipment, or a non-recoverable corruption of data. Warnings include instructions for preventing such damage. Please observe warning icons and read the accompanying text completely before carrying out the procedure.

Caution

The caution icon indicates non-catastrophic incidents, complex practices, or procedures which, if not observed, could result in damage to the hardware. Cautions include specific instructions for avoiding or minimizing these incidents.

Note

The note icon highlights exceptions and special information.

Tip

Tips provide extra information on the subject matter. This could include hints about how to use your current CWCEC card to its maximum potential.

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If you are unable to resolve installation or configuration-related difficulties using the guidance provided in this document, contact Technical Support or check out the Continuum Support Center web site for additional assistance:

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Once registered, you will have online access to additional or updated technical documentation, in addition to software components, etc. as these items become available.

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- Technical Support
- Professional Services
- Interoperability
- Repair and Warranty
- Software Upgrade Program
- Lifecycle Support

Repair and Warranty Information

Curtiss-Wright Controls Embedded Computing's standard warranty provides one-year coverage of parts and labor and also features:

- A repair turnaround target of 15 business days
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- No-fault-found coverage
- Quality Engineering services such as corrective repair reporting and failure analysis when warranted

Repairs outside the scope of the warranty are performed for a fixed price for in-production cards. Fixed prices help customers achieve cost determinism and, through streamlined administration associated with fixed prices, shorten repair turn-around times.

To obtain and prepare a Return Material Authorization (RMA) form, click on the "Repair & Warranty" link available on the Tech Support Contact page identified above.

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1 PMC-605 PCI-P0 BRIDGE MODULE

GENERAL DESCRIPTION

The PMC-605 PCI-P0 Bridge Module is a single-width PMC module that extends the local PCI bus of its host Single Board Computer (SBC) out to the SBC's P0 connector. This enables the SBC to communicate with other similarly equipped cards in the VMEbus system over a high-speed PCI bus (referred to as the PCI-P0 bus in this manual).

The PMC-605 performs such functions as:

- Expanding the number of PMC modules attached to a processor card (single board computer or digital signal processor)
- Interconnecting multiple processor cards via a high-speed PCI secondary backplane.
- Providing a private PCI data path to custom I/O cards.

Figure 1.1 shows a sample application of the PMC-605. The two SBCs use the PMC-605 to access each others' shared PCI resources while the SVME/DMV-210 Carrier Card extends the PCI bus of each single board computer with additional I/O capabilities.

FIGURE 1.1: Sample Application of PMC-605 PCI-P0 Bridge Module

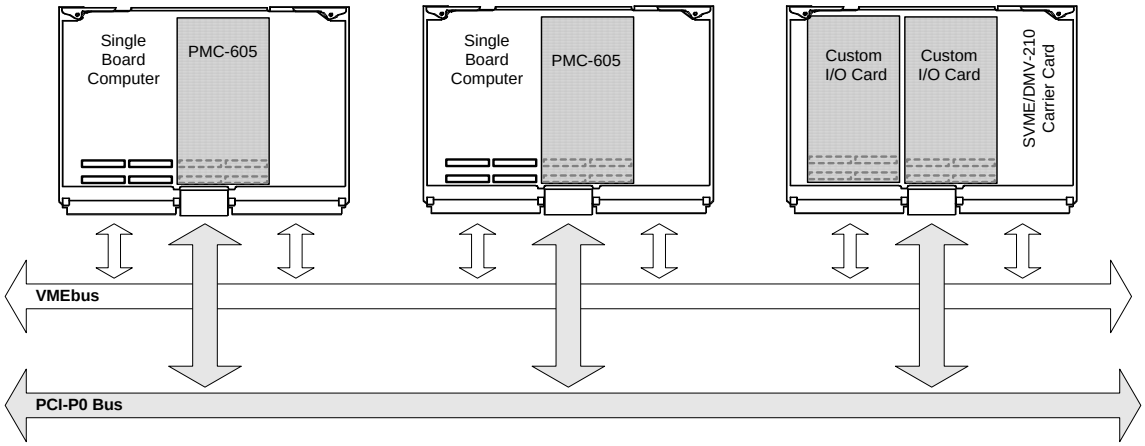

Figure 1.2 shows a functional block diagram of the PMC-605.

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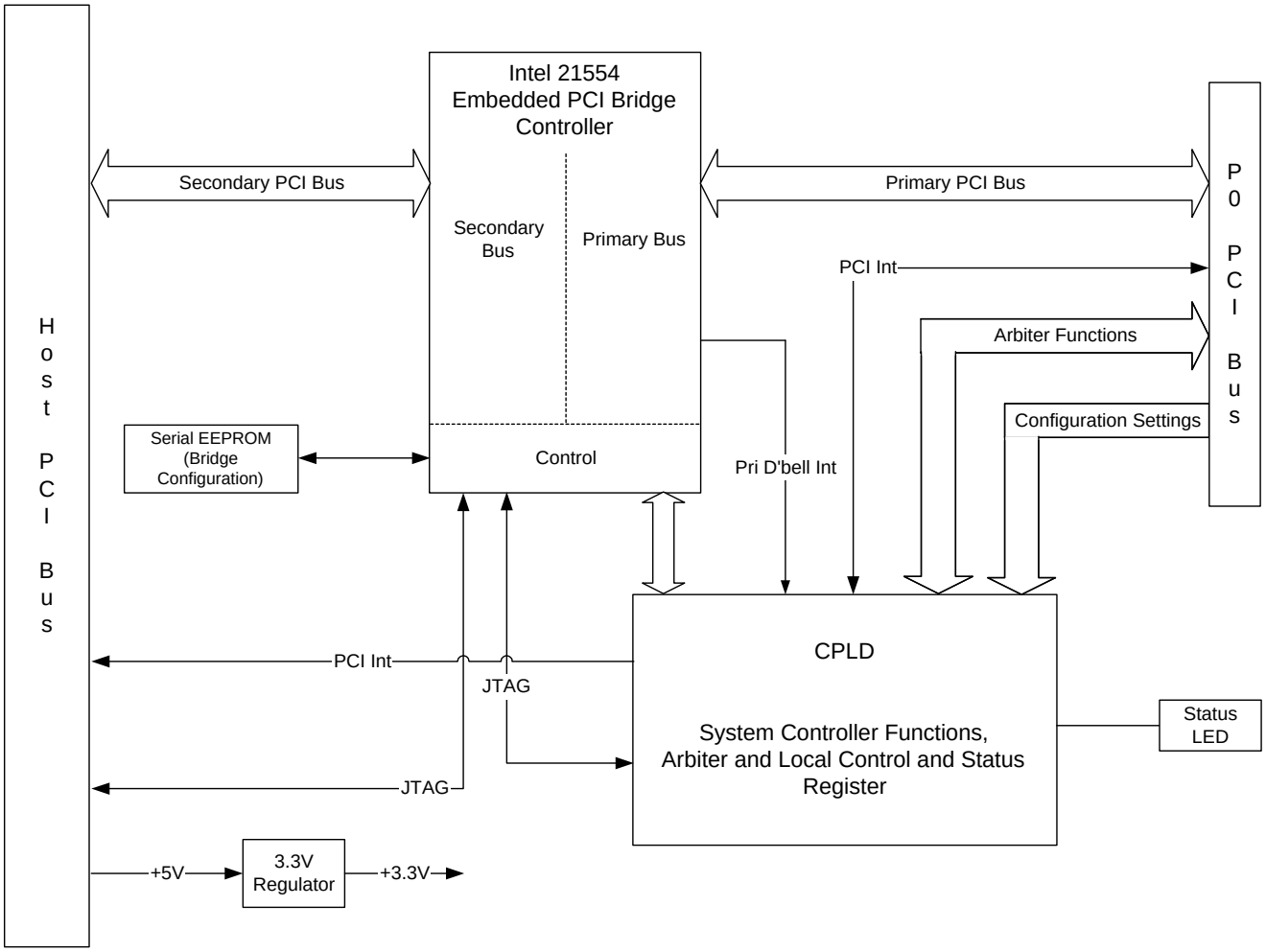
FIGURE 1.2: PMC-605 Functional Block Diagram



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SUMMARY OF FEATURES

The PMC-605 has the following major features:

Clock Speed

The Intel 21554 PCI-to-PCI Bridge device supports a clock speed of 33 MHz on the Secondary PCI Bus and 33 MHz on the Primary PCI bus. The Primary PCI bus connects to the PCI-P0 bus and the Secondary PCI bus interface connects to the Host PCI bus.

Bus Arbitration

The PMC-605 is dynamically configured during power-up or reboot to act as the bus arbiter when placed in the PCI-P0 backplane's System Slot. The PMC-605 uses a parallel arbitration scheme.

PCI Bus Clock

The PMC-605 can generate a PCI bus clock for the PCI-P0 bus or receive it from an external source. The PCI bus clock is dynamically enabled when placed in the PCI-P0 backplane's System Slot and is disabled when placed in a Peripheral Slot.

Synchronous and Asynchronous Operation

The PCI-P0 bus can be synchronous to the Primary PCI bus or operate completely asynchronously according to the configuration of its PCI bus clock source.

System Slot Termination

The PMC-605 is dynamically configured during power-up or reboot to terminate signals as necessary for the PCI bus when placed in the PCI-P0 backplane's System Slot.

Power Requirements

The PCI-P0 bus is 3.3 V signalling, 5 V tolerant. The PMC-605 is powered via the basecard's +5 V rail; an on-board regulator provides +3.3 V.

Configuration EEPROM

A serial EEPROM stores basic configuration information for the 21554 PCI-to-PCI Bridge device.

JTAG Support

The CPLD supports the IEEE Std 1149.1 boundary scan (JTAG) and is In-System Programmable (if so configured by the fitting of optional zero ohm resistors) through the host SBC JTAG interface. If the optional zero ohm resistors are not fitted, the CPLD must be programmed through an on-board header. Note that the Intel 21554 is not included as part of the JTAG loop.

Ruggedization Levels

The PMC-605 is available in air-cooled and conduction-cooled versions.

LED

The PMC-605 has a green software-controllable power-on LED.

Note

More information on the PMC-605 features listed above is provided in the following sections.

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PCI-P0 BRIDGE DESCRIPTION

21554 PCI-TO-PCI-BRIDGE CONTROLLER

The PMC-605 uses the Intel 21554 Embedded PCI-to-PCI Bridge device. The 21554 is a non-transparent PCI-to-PCI bridge designed to connect multiple processor domains, enabling the host basecard to independently configure and control the local subsystem.

Cross Reference

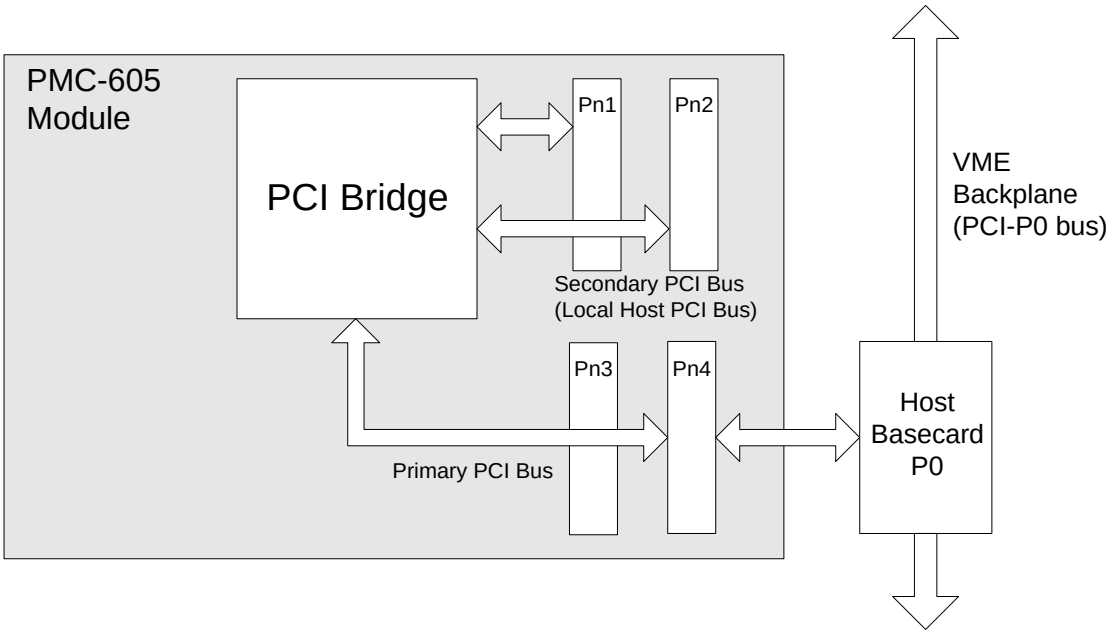
The 21554 responds to Type 0 configuration cycles. For information about this device refer to the Intel's *Getting Started with the 21554 Embedded PCI-to-PCI Bridge Application Note*, document #278210-001. Manuals and data sheets on the 21554 can be downloaded from Intel's website at *http://developer.intel.com*.

PRIMARY AND SECONDARY PCI BUSES

The PMC-605's Primary PCI bus runs through the P4 connector to the P0 connector on the basecard. The Primary PCI bus runs at 33 MHz and supports 32-bit addressing and data transfers.

The Secondary PCI bus is connected to the host basecard's local PCI bus. The Secondary PCI bus runs at 33 MHz and supports 64-bit addressing and data transfers.

FIGURE 1.3: Primary and Secondary PCI Buses



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PCI-P0 BUS ARBITRATION

The PMC-605 can act as the bus arbiter for the PCI-P0 bus. A CPLD provides the arbitration functions; the arbitration functions built into the 21554 bridge chip are not used.

Arbitration Scheme

The PMC-605 uses a parallel arbitration scheme in which each card on the PCI-P0 bus is free to request the use of the bus at any time. The PMC-605 acting as bus arbiter grants the bus on a “first come, first serve” basis.

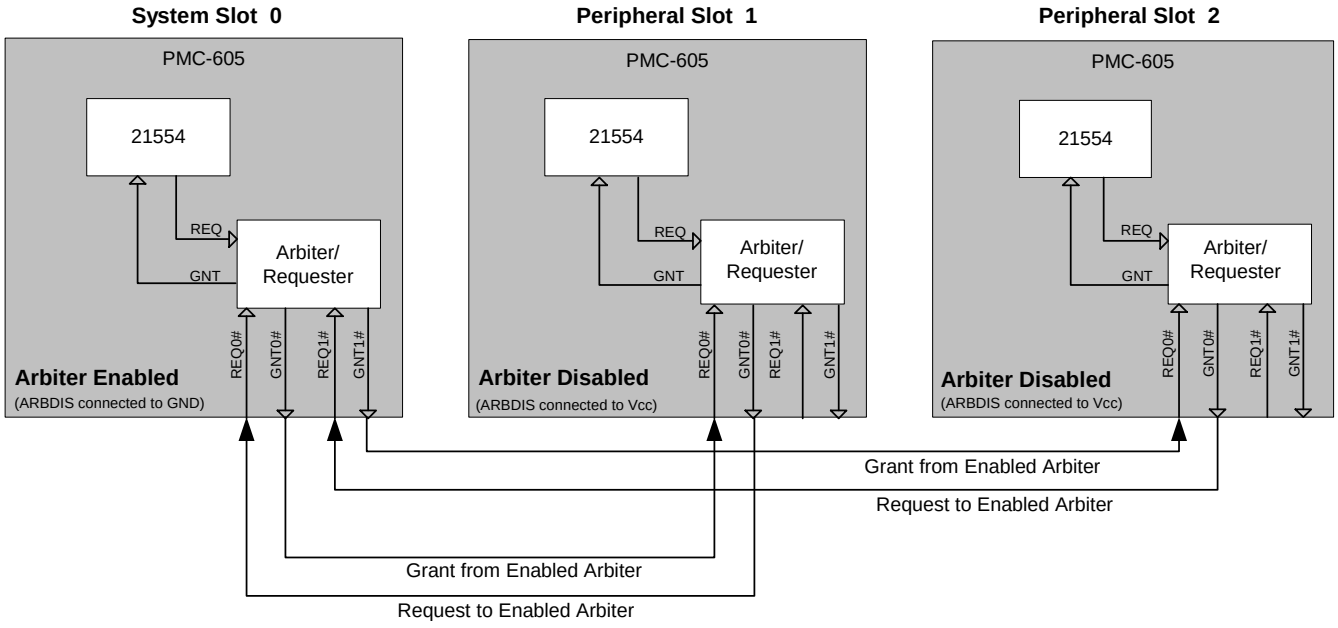
PCI-P0 Bus Arbiter Enable/Disable

The PMC-605 acts as the PCI-P0 bus arbiter when the ARBDIS signal is connected directly to Ground. When the arbiter function is enabled, REQ0# and REQ1# signals are inputs to the arbiter, signalling that the asserting device requests the use of the PCI-P0 bus. After completing the arbitration process, the arbiter asserts the GNT0# or GNT1# signal to the requesting device.

The PMC-605’s arbiter function is disabled when the ARBDIS signal is connected to Vcc. When the arbiter function is disabled, the role of REQ0# and GNT0# become reversed. The REQ0# pin functions as GNT0# (i.e. becomes the Grant 0 input) and the GNT0# pin functions as REQ0# (i.e. becomes the Request 0 output). In other words, REQ*n*# signals are always inputs and GNT*n*# signals are always outputs.

Figure 1.4 illustrates the function of each signal when the PMC-605’s arbiter function is either enabled or disabled.

FIGURE 1.4: Bus Arbitration and Signal Direction



Caution

The ARBDIS signal must not be left open circuit because it is an input to the arbiter device which does not have a pull-up on it. Inputs should not be left floating. Also note that only one card in the system should be configured as the bus arbiter.

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Cross Reference

Refer to "Bus Arbiter Jumper Settings" on page 3-2 for information on configuring arbiter settings when using the PMC-605 with the PCI-P0 Development Backplane (part number BPL-605-002 or BPL-605-003).

PCI-P0 BUS CLOCK

The PMC-605 functions as the PCI-P0 bus clock source when the CLKDIS signal is connected directly to Ground. The PMC-605 provides a 33 MHz clock source on both SCLK0 and SCLK1.

The PCI-P0 bus clock source is disabled when the CLKDIS signal is connected directly to Vcc. In this mode the PCI-P0 bus clock needs to be provided from an external source (such as from a basecard's 33 MHz clock or another PMC-605). The PCI-P0 clock source is always received on PCLK0. PCLK1 is only used in systems with more than three slots on the PCI-P0 bus.

Cross Reference

The CLKDIS signal referred to above is connected to Ground or Vcc via the 2 or 3 slot PCI-P0 Development Backplane (part number BPL-605-002 or BPL-605-003). See "PCI Bus Clock Jumper Settings" on page 3-4 for details.

The state of the PMC-605's arbiter function has no affect on clock selection.

Caution

CLKDIS must not be left open circuit because it is an input to the CPLD which does not have a pull-up on it. Inputs should not be left floating. **The PMC-605 may not be detected by the host processor if this line is left open.**

Also note that there should be only one card on the PCI-P0 bus that provides the clock source.

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PCI-P0 Clock Source Configurations

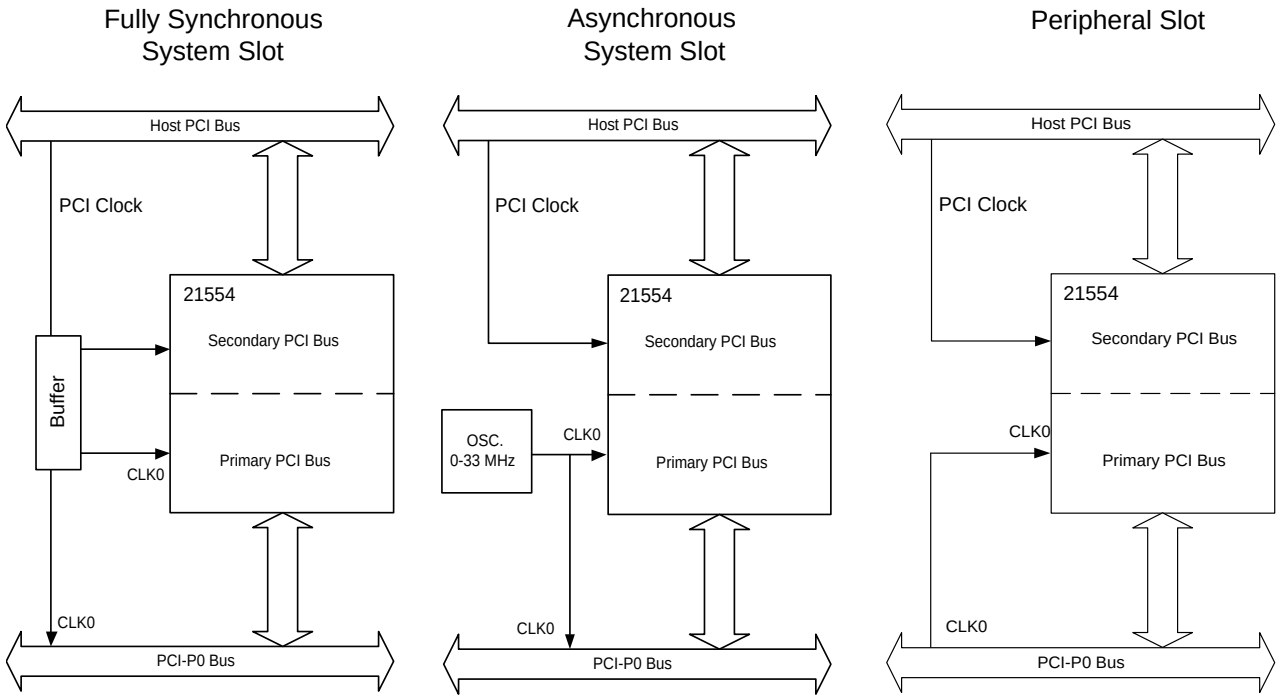
Table 1.1 and Figure 1.5 describe the different clock source configurations possible with the PMC-605 in a two or three slot backplane configuration.

TABLE 1.1: Clock Source Configurations

Configuration	Description
Fully Synchronous Clock System Slot	The PMC-605 in the system slot receives a 33 MHz clock source from its host card and routes it over the PCI-P0 bus to the other PMC-605s. In this configuration, the bus clock source is disabled for all PMC-605s in the system. The primary and secondary buses of each PMC-605 module operate at the same clock speed.
Asynchronous System Slot	The PMC-605 in the system slot receives a 33 MHz clock source from its host card to provide timing for its secondary side. The PMC-605's primary bus uses a clock source generated by its on-board oscillator (**see Note**) and routes this second clock over the PCI-P0 bus. In this configuration, the primary and secondary sides can operate at different clock speeds.
Peripheral Slot	PMC-605 modules in the peripheral slots receive clocking from their host cards for their secondary sides. Their primary buses use a clock source on the PCI-P0 bus.

Note:
The on-board oscillator is not installed on standard versions of the PMC-605 product. Consult the factory if you require a version of the product that includes the oscillator.

FIGURE 1.5: PCI-P0 Clock Source Configurations



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PCI-P0 SYSTEM SLOT TERMINATION

The PMC-605 terminates signals as required for a PCI System Slot Controller when the TERMDIS signal is connected directly to Ground. The System Slot termination is disabled when the TERMDIS signal is connected directly to Vcc.

Cross Reference

The TERMDIS signal referred to above is connected to Ground or Vcc via the 2 or 3 slot PCI-P0 Development Backplane (part number BPL-605-002 or BPL-605-003). The PMC-605 terminates signals when placed in the PCI-P0 backplane's System Slot. It does not terminate signals when placed in a Peripheral Slot. See "System Slot Termination Jumper Settings" on page 3-5 of this manual for information on configuring signal termination settings when using the PMC-605 with the PCI-P0 Development Backplane.

The term *System Slot Controller* refers to a PMC-605 when it is configured to provide PCI bus arbitration on the PCI-P0, distribute the PCI Bus clock across the backplane, and provide termination of specific signals.

In a multi-slot system, the bus is normally 'parked' on the System slot by the arbiter when the arbiter assigns a card default ownership of the bus. This ensures that the majority of the signals on the bus are driven but reduces power requirements by removing the necessity of each card having pull-ups. Some signals, however, need to be free for any card to assert. These signals cannot be left floating or driven and hence the System Controller provides the pull-ups (terminations) for these signals. On the PMC-605 these signals are: FRAME, TRDY, IRDY, DEVSEL, STOP, SERR, PERR and INTA.

Caution

The TERMDIS signal must not be left open circuit because it is an input to the CPLD which does not have a pull-up on it. Inputs should not be left floating.

INTERRUPTS

The 21554 PCI-to-PCI Bridge device does not accept interrupts although it may generate them to either the primary bus (P0 side) or secondary bus (host processor side). Any P0 bus interrupt is seen directly by the basecard, as long as bit D5 of the LCSR is set to a '1' - if bit D5 of the LCSR is set to a '0' (default), then the P0 bus interrupt is withheld from the basecard.

Interrupts are passed between processor cards using "doorbell" registers in the 21554. Interrupts from non-intelligent cards use the INT line on the PCI-P0 bus and are buffered through the PMC-605 card to the host processor card.

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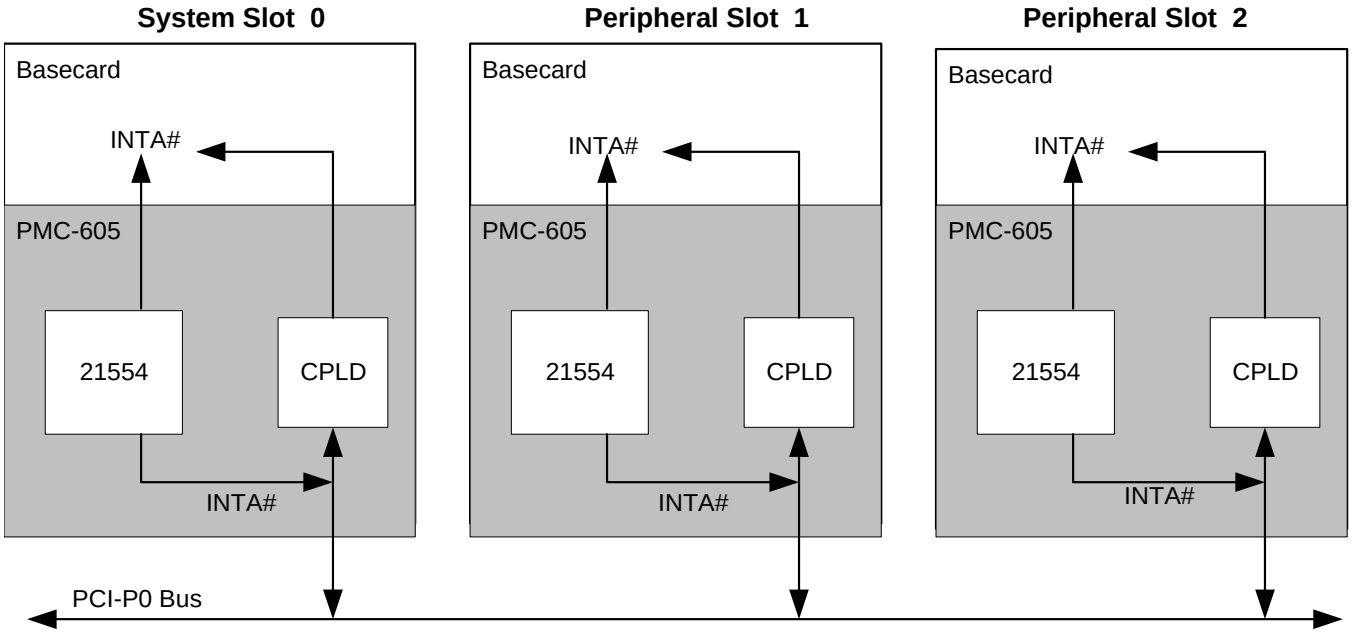
FIGURE 1.6: Inter-Card Interrupt Mechanism



Generating PCI-P0 Bus Interrupts

The PMC-605 can generate an interrupt on PCI-P0 bus (INTA#) using the doorbell registers in the 21554. This interrupt is routed to INTA# on the host PCI bus.

Inter-card Interrupt Mechanism

The PMC-605 uses the 21554 Secondary Interrupt Request register to assert INTA# on the host PCI bus. This provides an inter-card interrupt mechanism directly under software control.

Cross Reference

The PCI-P0 INTA# to the host PCI bus is enabled and disabled by a software-controllable bit in the PMC-605's Local Control and Status Register (LCSR). Refer to page 1-10 for information on the LCSR.

RESET

Only a card with TERMDIS grounded can generate a PCI-P0 Reset. It can either follow the Reset signal from the host or it can be initiated from the host through software.

The PMC-605 does not accept resets from the PCI-P0 bus, regardless of the state of TERMDIS. If an external PMC-605 reset is required, this must be done via the host basecard's VME interface.

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SERIAL EEPROM

A serial EEPROM provides basic configuration details to the 21554 PCI-to-PCI Bridge device such as subsystem vendor ID ("D4D4") and subsystem device ID ("0605"). The configuration details can be programmed by the host card and read by the 21554 after power-up or card reset. Refer to Chapter 4 of this manual and Appendix A of the *V8 Foundation Firmware User's Manual* (808006) for more information.

LED

The PMC-605 has a green power-on LED that is software-controllable via the Local Control and Status Register (LCSR). After Power up or reset, the LED will be initially illuminated. The LED is extinguished when the PMC605 is successfully initialized and its diagnostics passed by FF/W.

REGISTERS

The Local Control and Status Register (LCSR) is a byte-wide register residing within the address space defined by the PCI Expansion ROM Base Address set within the 21554 PCI-to-PCI Bridge device.

The bit definitions of the LCSR are as described in Table 1.2.

TABLE 1.2: Local Control and Status Register (LCSR)

D7	D6	D5	D4	D3	D2	D1	D0
Not Used	Not Used	Host INTA# Enable	LED Control	Arbiter Mode	Arbiter Status	Clock Source	Termina-tion Status

Bit	Name	Description	R/W	@ Reset
D7	N/A	N/A	X	X
D6	N/A	N/A	X	X
D5	Host INTA# Enable	1 = Host INTA# is enabled 0 = Host INTA# is disabled	R/W	0
D4	LED Control	1 = LED On 0 = LED Off	R/W	1
D3	Arbiter Mode	1 = Serial Arbitration 0 = Parallel Arbitration	R	As per backplane configuration
D2	Arbiter Status	1 = Arbiter Disabled 0 = Arbiter Enabled	R	As per backplane configuration
D1	Clock Source	1 = Clock Source Disabled 0 = Clock Source Enabled	R	As per backplane configuration
D0	Termination Status	1 = Termination Disabled 0 = Termination Enabled	R	As per backplane configuration

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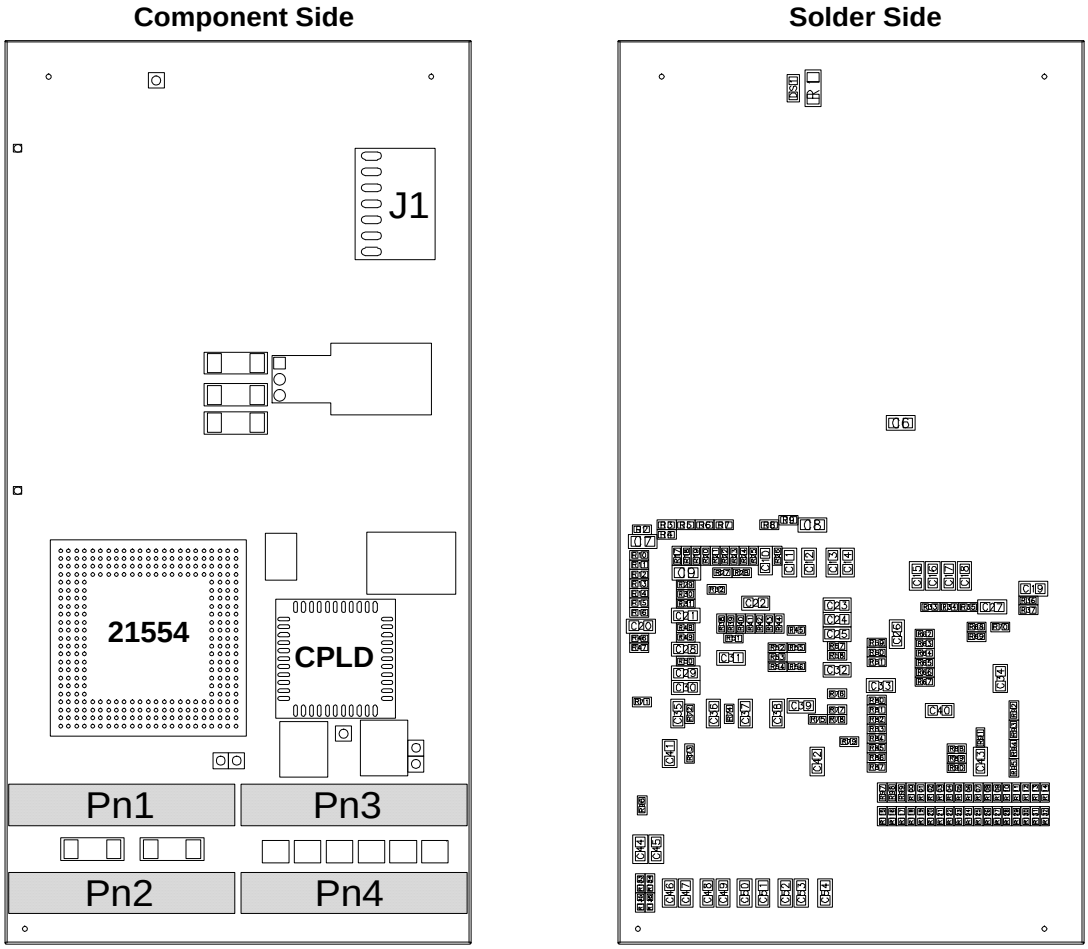
PHYSICAL, ELECTRICAL, AND ENVIRONMENTAL CHARACTERISTICS

Figure 1.7 shows the location of the major components and the mating connectors on the PMC-605.

FIGURE 1.7: PMC-605 Physical Layout



DIMENSIONS

The PMC-605 is built on a standard PCI Mezzanine Card (PMC) Printed Wiring Board (PWB) and is VITA 20 compliant.

MATING CONNECTORS

The connectors Pn1, Pn2, Pn3, and Pn4 are compliant with IEEE P1386.

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ELECTRICAL CHARACTERISTICS

The PMC-605 is powered from the basecard's +5 V rail and operates with a steady state input voltage of 5.0 +/- 0.25 volts DC with a maximum current of 0.75 A. It draws less than 4 watts of power. An on-board regulator provides +3.3 V for the 21554 PCI to PCI Bridge device. The PMC-605 does not require + 3.3 V from its host basecard.

ENVIRONMENTAL CHARACTERISTICS

Table 1.3 shows the complete range of environmental specification limits used to categorize the ruggedization levels of CWCEC products. The PMC-605 is available in ruggedization levels 0 and 200.

TABLE 1.3: Environmental Specification Limits and Ruggedization Levels

Card	Operating Temperature	Storage Temperature	Operating Humidity	Storage Humidity	Sine Vibration (note 1)	Random Vibration (note 4)	Mechanical Shock (note 5)
Air-Cooled Level 0	0°C to 50°C inlet 4 cfm air flow (note 6)	-40°C to 85°C	0 to 95% non-condensing	0 to 95% non-condensing	N/A	N/A	N/A
Air-Cooled Level 50	-20°C to 65°C inlet 4 cfm air flow (note 6)	-40°C to 85°C	0 to 100% non-condensing	0 to 100% non-condensing	N/A	0.02 g^2/Hz 20-2000 Hz	30 g peak half sine pulse 11 ms duration
Air-Cooled Level 100	-40°C to 71°C inlet 4 cfm air flow (note 6)	-55°C to 85°C	0 to 100% non-condensing	0 to 100% non-condensing	10 g peak 15-2000 Hz (note 2)	0.04 g^2/Hz 15-2000 Hz	30 g peak half sine pulse 11 ms duration
Conduction-Cooled Level 100	-40°C to 71°C card edge temperature	-55°C to 85°C	0 to 100% non-condensing	0 to 100% non-condensing	10 g 15-2000 Hz (note 3)	0.01 g^2/Hz 15-2000 Hz	40 g peak half sine pulse 11 ms duration
Conduction-Cooled Level 200	-55°C to 85°C card edge temperature	-62°C to 125°C	0 to 100% non-condensing	0 to 100% condensing	10 g 15-2000 Hz (note 3)	0.1 g^2/Hz 15-2000 Hz	40 g peak half sine pulse 11 ms duration

Notes

1. All levels based on a sweep duration of ten minutes per axis, each of three mutually perpendicular axis.
2. Displacement limited to 0.10 inches D.A. from 15 to 44 Hz.
3. Displacement limited to 0.436 inches D.A. from 15 to 21 Hz.
4. 60 minutes per axis each of three mutually perpendicular axes.
5. Three hits per direction per axis (total of 18 hits).
6. At sea level.

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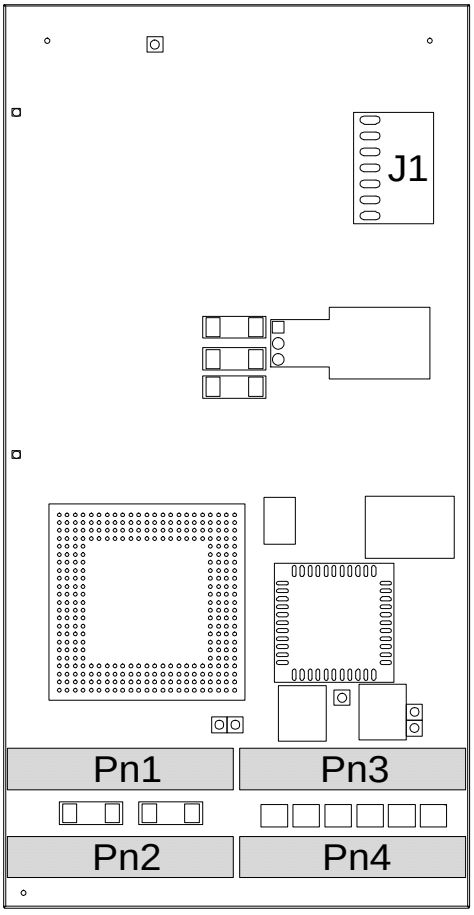
CONNECTOR PIN ASSIGNMENTS

CONNECTOR LOCATIONS

The locations of the Pn1, Pn2, Pn3, Pn3 and J1 connectors are shown in Figure 1.8.

FIGURE 1.8: Connector Locations



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PN1/PN2 PIN ASSIGNMENTS

TABLE 1.4: Pn1/Pn2 Pin Assignments

Pn1 32-bit PCI			
Pin #	**Signal Name**	**Signal Name**	**Pin #**
1	TCK	-12V	2
3	Ground	INTA#	4
5	INTB#	INTC#	6
7	BUSMODE1#	+5V	8
9	INTD#	PCI-RSVD*	10
11	Ground	PCI-RSVD*	12
13	CLK	Ground	14
15	Ground	GNT#	16
17	REQ#	+5V	18
19	V (I/O)	AD[31]	20
21	AD[28]	AD[27]	22
23	AD[25]	Ground	24
25	Ground	C/BE[3]#	26
27	AD[22]	AD[21]	28
29	AD[19]	+5V	30
31	V(I/O)	AD[17]	32
33	FRAME#	Ground	34
35	Ground	IRDY#	36
37	DEVSEL#	+5V	38
39	Ground	LOCK#	40
41	SDONE#	SBO#	42
43	PAR	Ground	44
45	V(I/O)	AD[15]	46
47	AD[12]	AD[11]	48
49	AD[09]	+5V	50
51	Ground	C/BE[0]#	52
53	AD[06]	AD[05]	54
55	AD[04]	Ground	56
57	V(I/O)	AD[03]	58
59	AD[02]	AD[01]	60
61	AD[00]	+5V	62
63	Ground	REQ64#	64

Pn2 32-bit PCI			
Pin #	**Signal Name**	**Signal Name**	**Pin #**
1	+12V	TRST#	2
3	TMS	TDO	4
5	TDI	Ground	6
7	Ground	PCI-RSVD*	8
9	PCI-RSVD*	PCI-RSVD*	10
11	BUSMODE2#	+3.3V	12
13	RST#	BUSMODE3#	14
15	3.3V	BUSMODE4#	16
17	PCI-RSVD*	Ground	18
19	AD[30]	AD[29]	20
21	Ground	AD[26]	22
23	AD[24]	+3.3V	24
25	IDSEL	AD[23]	26
27	+3.3V	AD[20]	28
29	AD[18]	Ground	30
31	AD[16]	C/BE[2]#	32
33	Ground	PMC-RSVD	34
35	TRDY#	+3.3V	36
37	Ground	STOP#	38
39	PERR#	Ground	40
41	+3.3V	SERR#	42
43	C/BE[1]#	Ground	44
45	AD[14]	AD[13]	46
47	Ground	AD[10]	48
49	AD[08]	+3.3V	50
51	AD[07]	PMC-RSVD	52
53	+3.3V	PMC-RSVD	54
55	PMC-RSVD	Ground	56
57	PMC-RSVD	PMC-RSVD	58
59	Ground	PMC-RSVD	60
61	ACK64#	+3.3V	62
63	Ground	PMC-RSVD	64

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PN3 PIN ASSIGNMENTS

TABLE 1.5: Pn3 Pin Assignments

Pin #	Signal Name	Signal Name	Pin #
1	PCI-RSVD	GND	2
3	GND	CBE7#	4
5	CBE6#	CBE5#	6
7	CBE4#	GND	8
9	V(I/O)	PAR64	10
11	AD[63]	AD[62]	12
13	AD[61]	GND	14
15	GND	AD[60]	16
17	AD[59]	AD[58]	18
19	AD[57]	GND	20
21	V(I/O)	AD[56]	22
23	AD[55]	AD[54]	24
25	Ad[53]	GND	26
27	GND	AD[52]	28
29	AD[51]	AD[50]	30
31	AD[49]	GND	32
33	GND	AD[48]	34
35	AD[47]	AD[46]	36
37	AD[45]	GND	38
39	V(I/O)	AD[44]	40
41	AD[43]	AD[42]	42
43	AD[41]	GND	44
45	GND	AD[40]	46
47	AD[39]	AD[38]	48
49	AD[37]	GND	50
51	GND	AD[36]	52
53	AD35	AD34	54
55	AD33	GND	56
57	V(I/O)	AD32	58
59	PCI-RSVD	PCI-RSVD	60
61	PCI-RSVD	GND	62
63	GND	PCI-RSVD	64

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PN4 PIN ASSIGNMENTS

TABLE 1.6: Pn4 Pin Assignments

Pin #	Signal Name	Signal Name	Pin #
1	RST#	PCLK0	2
3	REQ0#	GND	4
5	GNT0#	INTA#	6
7	GND	PCLK1	8
9	REQ1#	DEVSEL#	10
11	GNT1#	SERARB	12
13	IRDY#	TRDY#	14
15	+5 V	SERR#	16
17	IDSEL	PERR#	18
19	STOP#	TERMDIS	20
21	PAR	FRAME#	22
23	CLOCKDIS	CBE3	24
25	CBE2	CBE0	26
27	CBE1	ARBDIS	28
29	AD0	AD1	30
31	AD2	AD3	32
33	AD4	AD5	34
35	GND	AD7	36
37	AD6	AD9	38
39	AD8	AD11	40
41	AD10	AD13	42
43	AD12	GND	44
45	AD14	AD15	46
47	AD16	AD17	48
49	AD18	AD19	50
51	GND	AD21	52
53	AD20	AD23	54
55	AD22	AD25	56
57	AD24	AD27	58
59	AD26	GND	60
61	AD28	AD29	62
63	AD30	AD31	64

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J1 TEST JTAG PORT

TABLE 1.7: J1 Test JTAG Port Pin Assignments

Pin	Signal
1	TCK (Xilinx & Bridge)
2	TDI (Xilinx)
3	TMS (Xilinx & Bridge)
4	TDO (Xilinx - connects to TDI of Bridge)
5	+5 V
6	RST (Bridge)
7	TDO (Bridge)

SVME/DMV-179 SBC P0 Pin Assignments

On an SVME/DMV-179 Single Board Computer, the PMC-605 would typically be installed in the PMC1 interface in order to access the 179's P0 connector.

FIGURE 1.9: Location of PMC-605 on a SVME/DMV-179

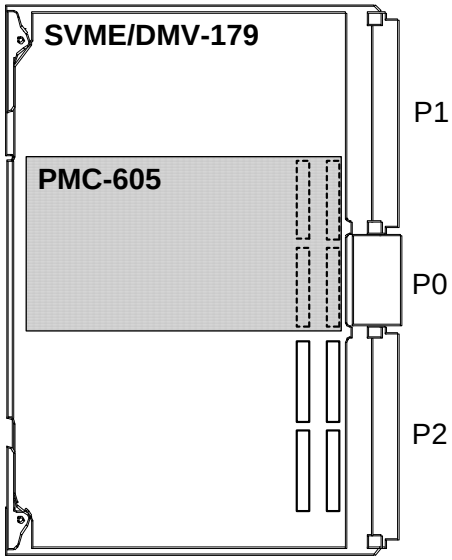

Table 1.8 describes the P0 connector of an SVME/DMV-179 with a PMC-605 mounted in the PMC1 interface. The shaded boxes represent PCI signals provided by the PMC-605 when plugged into the System Slot on the PCI-P0 backplane.

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TABLE 1.8: Sample SVME/DMV-179 P0 Connector Pin Assignments

Pin No.	Row E	Row D	Row C	Row B	Row A
1	CH1DSR	CH1RXD	CH1TXD	ENET_UPT2	ENET_UPT1
2	PIO(9)	PJTAG_TMS	GND	ENET_TXD+	ENET_TXD-
3	PIO(10)	CARDFAIL-	CRESET-	ENET_RXD+	ENET_RXD-
4	RST#	PCLK0	REQ0#	GND	GNT0#
5	INTA#	GND	PCLK1	REQ1#	DESEL#
6	GNT1#	SERARB	IRDY#	TRDY#	+5 V
7	SERR#	IDSEL	PERR#	STOP#	TERMDIS
8	PAR	FRAME#	CLOCKDIS	CBE3	CBE2
9	PIO(7)	PIO(5)	PIO(3)	PIO(1)	PIO(0)
10	PIO(8)	PIO(6)	PIO(4)	PIO(2)	Reserved
11	JTAG_TCK	JTAG_TDI	JTAG_TRST-	JTAG_TDO	Reserved
12	CBE0	CBE1	ARBDIS	AD0	AD1
13	AD2	AD3	AD4	AD5	GND
14	AD7	AD6	AD9	AD8	AD11
15	AD10	AD13	AD12	GND	AD14
16	AD15	AD16	AD17	AD18	AD19
17	GND	AD21	AD20	AD23	AD22
18	AD25	AD24	AD27	AD26	GND
19	AD28	AD29	AD30	AD31	PIO(11)

Note

To support PMC-605 I/O via the SVME/DMV-179 P0 connector, the SVME/DMV-179 must be ordered from the factory with support for either I/O Mode 1 or I/O Mode 4.

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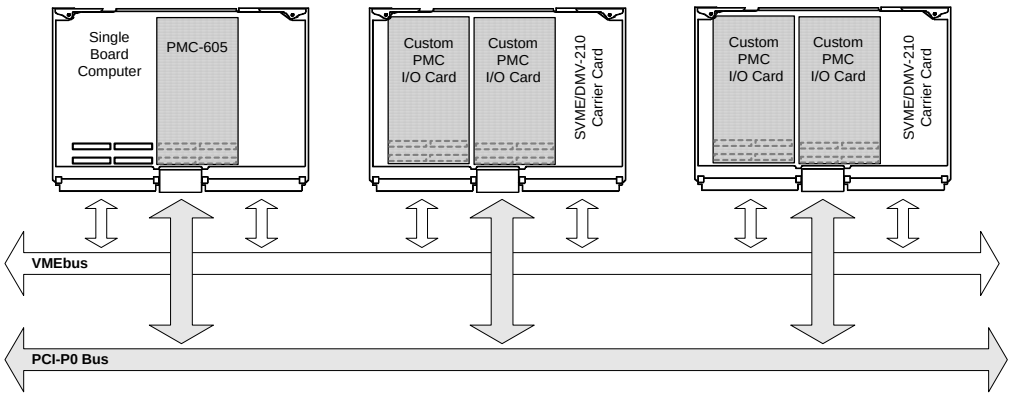
2 SVME/DMV-210 CARRIER CARD

GENERAL DESCRIPTION

The SVME/DMV-210 is a PCI/PMC carrier card that allows users to expand the number of PMC modules that can be driven from one processor card, by acting as a host for up to two on-board PMC modules. The SVME/DMV-210 uses the PCI-P0 bus to provide additional data bandwidth between cards where the VMEBus alone cannot meet the current demand.

The SVME/DMV-210 is used in conjunction with the PMC-605 to expand the PCI bus of a processor card (a Single Board Computer or SBC) through the P0 connector. Two SVME/DMV-210 cards can be supported by a single SBC, expanding the available PMC support to a total of five modules.

FIGURE 2.1: Sample Application of SVME/DMV-210 Carrier Card



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SUMMARY OF FEATURES

The SVME/DMV-210 has the following major features:

Bridge Device

Initiator-Target PCI Bridge Interface (Intel 21154 PCI-PCI bridge).

- P0 PCI data bus: 32-bit 25 MHz minimum (33 MHz typical)
- PMC PCI data bus: 64-bit 25 MHz minimum (33 MHz typical)

PMC Support

Allows for initiator capable I/O cards. Connector IO Routing (PMC I/O to P2/P0). Supports interrupts to the processor card.

Interrupts

The SVME/DMV-210 transfers interrupts from PMC cards to INTA# on the PCI-P0 bus.

Dimensions

The SVME/DMV-210 uses standard VME 6U eurocard dimensions and is compliant with ANSI/VITA 1-1994 DRAFT 1.11 0 April 1995 VME64bus Specification.

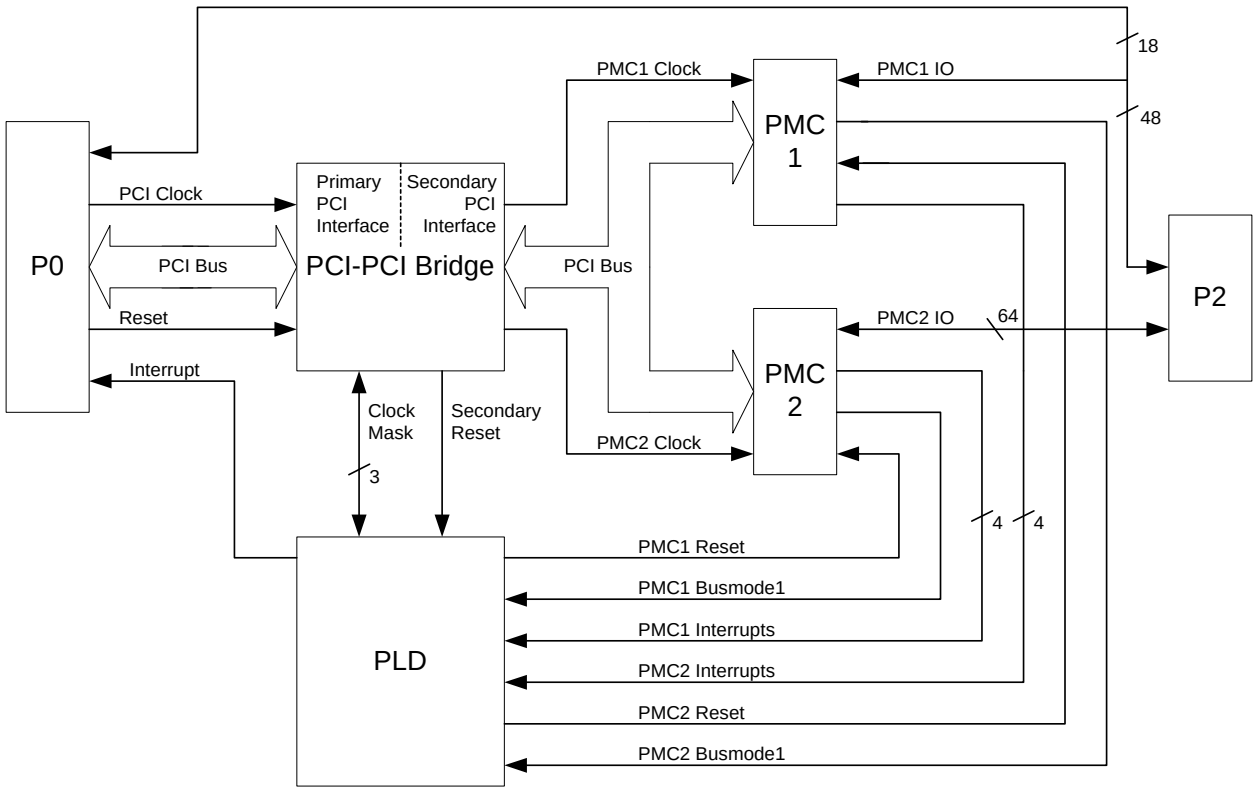
Power Requirements

The SVME/DMV-210 requires a +5V (±0.25V) input power supply from the backplane. An on-board regulator provides 3.3V, capable of providing up to 12 W or 3.5 A. The maximum current used by the SVME/DMV-210, not including that used by PMC modules, is 1000 mA. The +12 V and -12 V power supplies from the VMEbus are routed to the PMC modules.

Ruggedization Levels

The SVME/DMV-210 is available in air-cooled ruggedization level 0 and conduction cooled level 200 (-40°C to +85°C card edge) versions. An Auxiliary Thermal Interface is provided for the conduction cooled version.

FIGURE 2.2: SVME/DMV-210 Block Diagram



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PCI-P0 BRIDGE DESCRIPTION

The SVME/DMV-210 uses the Intel 21154 PCI to PCI transparent bridge to connect the PMC modules to the PCI-P0 bus. The bridge has a 32-bit, 25 MHz (minimum, 33 MHz typical) Initiator-Target PCI primary interface and a 64-bit, 25 MHz (minimum, 33 MHz typical) Initiator-Target PCI secondary interface. It is fully compliant with the PCI Specification, Revision 2.1, and supports parity checking on both the PCI-P0 bus and the PMC bus.

The use of the 21154 PCI to PCI bridge decouples the PMC PCI bus from the P0 PCI bus. This will permit concurrent bus activity to occur on the P0 bus and PMC PCI bus.

All devices on the SVME/DMV-210 are accessible in the PCI configuration space as well as the PCI memory space and/or the PCI I/O space.

Cross Reference

For more information on the 21154 bridge device, refer to the Intel 21154 PCI-to-PCI Bridge Datasheet, available for download at *http://developer.intel.com*.

CONFIGURATION

The 21154 configuration registers are initialized from the PCI-P0 bus by the host processor. The 21154 responds to both Type 0 and Type 1 configuration cycles to configure the bridge itself and the PMC modules installed on the SVME/DMV-210 Carrier Card.

PCI SIGNAL ENVIRONMENT

The 21154 is a +3.3 V device that is +5 V tolerant. Both the PCI-P0 bus and the PMC bus can use either +3.3 V or +5 V independently of each other.

The SVME/DMV-210 incorporates electronic bus switches that permit either 3.3V or a 5V PMC modules to be added, with no need to change the configuration. 3.3V or 5V PMC modules can be installed in either PMC module site on the SVME/DMV-210 in any combination.

PCI SYSTEM RESET (RST#)

The PCI RST# signal from the PCI-P0 bus is used as the master reset for the SVME/DMV-210. A low logic level on this signal resets the 21154 bridge and both PMC sites.

Reset signals are routed to the reset input of the primary PCI interface of the 21154 bridge. The secondary reset output from the 21154 bridge is connected to the CPLD and individual resets are routed to the two PMC sites.

PCI INTERRUPTS

The SVME/DMV-210 can generate a single interrupt (INTA#) to the processor card. The source can be any of the four PCI interrupts from either of the two PMC modules. The processor card can determine the source of the PCI interrupt by interrogating the individual PMC modules installed on the SVME/DMV-210.

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PCI JTAG TEST SIGNALS

The SVME/DMV-210 does not support PCI JTAG test signals.

PMC BUS MODE SIGNALS

The PMC Busmode[4:2] signals are tied to the appropriate logic level on the SVME/DMV-210:

- the Busmode1 signal from each PMC site is connected to the on-board CPLD
- the Busmode2 signal is connected to +3.3V
- the Busmode3 and Busmode4 signals are connected to Ground

The presence of a PMC module is indicated by the assertion of the Busmode1 signal of the corresponding PMC site.

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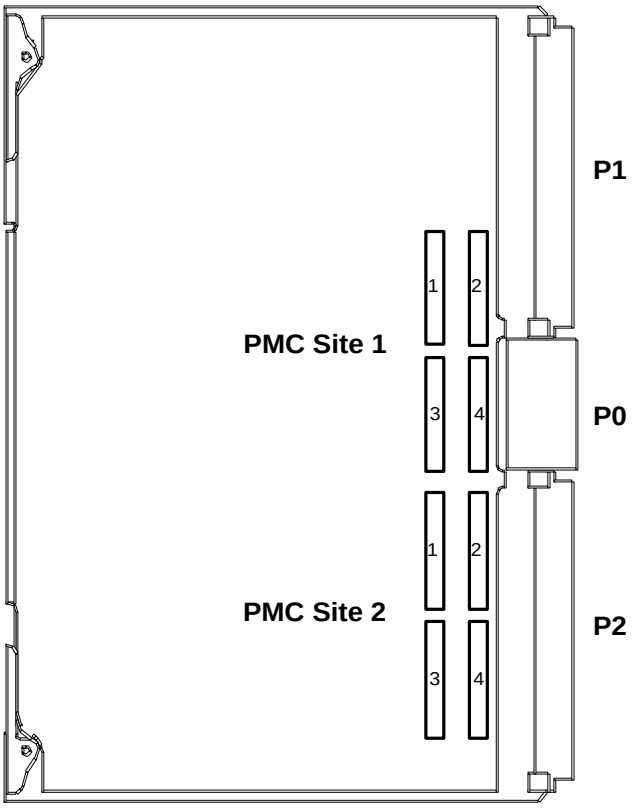
PHYSICAL, ELECTRICAL, AND ENVIRONMENTAL CHARACTERISTICS

Figure 2.3 shows the location of the major components and the mating connectors on the SVME/DMV-210.

FIGURE 2.3: SVME/DMV-210 Physical Layout



DIMENSIONS

The SVME/DMV-210 is built on a standard VMEbus 6U Printed Wiring Board (PWB) and is VITA 20 compliant.

MATING CONNECTORS

The connectors Pn1, Pn2, Pn3, and Pn4 are compliant with IEEE P1386.1/Draft 2.2 April 22, 2000.

The P1, P2, and P0 connectors conform to the ANSI/VITA 1-1994 Draft 1.11 10 April, 1995 VME64bus Specification.

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ELECTRICAL CHARACTERISTICS

The maximum current of the SVME/DMV-210 at +5 V is 1000 mA (PMC cards not included).

ENVIRONMENTAL CHARACTERISTICS

Table 2.1 shows the complete range of environmental specification limits used to categorize the ruggedization levels of CWCEC products. The SVME/DMV-210 is available in ruggedization levels 0 and 200.

TABLE 2.1: Environmental Specification Limits and Ruggedization Levels

Card	Operating Temperature	Storage Temperature	Operating Humidity	Storage Humidity	Sine Vibration (note 1)	Random Vibration (note 4)	Mechanical Shock (note 5)
Air-Cooled Level 0	0°C to 50°C inlet 4 cfm air flow (note 6)	-40°C to 85°C	0 to 95% non-condensing	0 to 95% non-condensing	N/A	N/A	N/A
Air-Cooled Level 50	-20°C to 65°C inlet 4 cfm air flow (note 6)	-40°C to 85°C	0 to 100% non-condensing	0 to 100% non-condensing	N/A	0.02 g^2/Hz 20-2000 Hz	30 g peak half sine pulse 11 ms duration
Air-Cooled Level 100	-40°C to 71°C inlet 4 cfm air flow (note 6)	-55°C to 85°C	0 to 100% non-condensing	0 to 100% non-condensing	10 g peak 15-2000 Hz (note 2)	0.04 g^2/Hz 15-2000 Hz	30 g peak half sine pulse 11 ms duration
Conduction-Cooled Level 100	-40°C to 71°C card edge temperature	-55°C to 85°C	0 to 100% non-condensing	0 to 100% non-condensing	10 g 15-2000 Hz (note 3)	0.01 g^2/Hz 15-2000 Hz	40 g peak half sine pulse 11 ms duration
Conduction-Cooled Level 200	-55°C to 85°C card edge temperature	-62°C to 125°C	0 to 100% non-condensing	0 to 100% condensing	10 g 15-2000 Hz (note 3)	0.1 g^2/Hz 15-2000 Hz	40 g peak half sine pulse 11 ms duration

Notes

1. All levels based on a sweep duration of ten minutes per axis, each of three mutually perpendicular axis.
2. Displacement limited to 0.10 inches D.A. from 15 to 44 Hz.
3. Displacement limited to 0.436 inches D.A. from 15 to 21 Hz.
4. 60 minutes per axis each of three mutually perpendicular axes.
5. Three hits per direction per axis (total of 18 hits).
6. At sea level.

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CONNECTOR PIN ASSIGNMENTS

PMC SITE 1: JN1 AND JN2 CONNECTORS

TABLE 2.2: PMC Site 1: Pin Assignments (Jn1 and Jn2)

PMC Site 1: Jn1 32 Bit PCI			
Pin #	**Signal Name**	**Signal Name**	**Pin #**
1	PMC_TCK	-12V	2
3	GND	PMC1_INTA#	4
5	PMC1_INTB#	PMC1_INTC#	6
7	PMC1_BUSMODE1	+5V	8
9	PMC1_INTD#	PMC1_PCIR1	10
11	GND	PMC1_PCIR2	12
13	PMC1_CLK	GND	14
15	GND	PMC1_GNT#	16
17	PMC1_REQ#	+5V	18
19	VIO	AD[31]	20
21	AD[28]	AD[27]	22
23	AD[25]	GND	24
25	GND	C/BE[3]#	26
27	AD[22]	AD[21]	28
29	AD[19]	+5V	30
31	VIO	AD[17]	32
33	PMC1_FRAME#	GND	34
35	GND	PMC1_IRDY#	36
37	PMC1_DEVSEL	+5V	38
39	GND	PMC1_LOCK#	40
41	PMC1_SDONE#	PMC1_SBO#	42
43	PMC1_PAR	GND	44
45	VIO	AD[15]	46
47	AD[12]	AD[11]	48
49	AD[09]	+5V	50
51	GND	C/BE[0]#	52
53	AD[06]	AD[05]	54
55	AD[04]	GND	56
57	VIO	AD[03]	58
59	AD[02]	AD[01]	60
61	AD[00]	+5V	62
63	GND	PMC1_REQ64#	64

PMC Site 1: Jn2 32 Bit PCI			
Pin #	**Signal Name**	**Signal Name**	**Pin #**
1	+12V	PMC_TRST	2
3	PMC_TMS	PMC1_TDO_NC	4
5	PMC_TDI	GND	6
7	GND	PMC1_PCIR5	8
9	PMC1_PCIR3	PMC1_PCIR6	10
11	+3.3V (PMC1_BUSMODE2)	+3.3V	12
13	PMC1_RST#	GND (BUSMODE3)	14
15	+3.3V	GND (BUSMODE4)	16
17	PMC1_PCIR4	GND	18
19	AD[30]	AD[29]	20
21	GND	AD[26]	22
23	AD[24]	+3.3V	24
25	PMC1_IDSEL	AD[23]	26
27	+3.3V	AD[20]	28
29	AD[18]	GND	30
31	AD[16]	C/BE[2]#	32
33	GND	PMC1_PMCR3	34
35	PMC1_TRDY#	+3.3V	36
37	GND	PMC1_STOP#	38
39	PMC1_PERR#	GND	40
41	+3.3V	PMC1_SERR#	42
43	C/BE[1]#	GND	44
45	AD[14]	AD[13]	46
47	GND	AD[10]	48
49	AD[08]	+3.3V	50
51	AD[07]	PMC1_PMCR4	52
53	+3.3V	PMC1_PMCR5	54
55	PMC1_PMCR1	GND	56
57	PMC1_PMCR2	PMC1_PMCR6	58
59	GND	PMC1_PMCR7	60
61	PMC1_ACK64#	+3.3V	62
63	GND	PMC1_PMCR8	64

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PMC SITE 1: JN3 AND JN4 CONNECTORS

TABLE 2.3: PMC Site 1: Pin Assignments (Jn3 and Jn4)

PMC Site 1: Jn3 32 Bit PCI			
Pin #	**Signal Name**	**Signal Name**	**Pin #**
1	PMC1_PCIR7	GND	2
3	GND	C/BE[7]#	4
5	C/BE[6]#	C/BE[5]#	6
7	C/BE[4]#	GND	8
9	VIO	PMC1_PAR64	10
11	AD[63]	AD[62]	12
13	AD[61]	GND	14
15	GND	AD[60]	16
17	AD[59]	AD[58]	18
19	AD[57]	GND	20
21	VIO	AD[56]	22
23	AD[55]	AD[54]	24
25	AD[53]	GND	26
27	GND	AD[52]	28
29	AD[51]	AD[50]	30
31	AD[49]	GND	32
33	GND	AD[48]	34
35	AD[47]	AD[46]	36
37	AD[45]	GND	38
39	VIO	AD[44]	40
41	AD[43]	AD[42	42
43	AD[41]	GND	44
45	GND	AD[40]	46
47	AD[39]	AD[38]	48
49	AD[37]	GND	50
51	GND	AD[36]	52
53	AD[35]	AD[34]	54
55	AD[33]	GND	56
57	VIO	AD[32]	58
59	PMC1_PCIR8	PMC1_PCIR10	60
61	PMC1_PCIR9	GND	62
63	GND	PMC1_PCIR11	64

PMC Site 1: Jn4 32 Bit PCI			
Pin #	**Signal Name**	**Signal Name**	**Pin #**
1	PMC1_IO[1]	PMC1_IO[2]	2
3	PMC1_IO[3]	PMC1_IO[4]	4
5	PMC1_IO[5]	PMC1_IO[6]	6
7	PMC1_IO[7]	PMC1_IO[8]	8
9	PMC1_IO[9]	PMC1_IO[10]	10
11	PMC1_IO[11]	PMC1_IO[12]	12
13	PMC1_IO[13]	PMC1_IO[14]	14
15	PMC1_IO[15]	PMC1_IO[16]	16
17	PMC1_IO[17]	PMC1_IO[18]	18
19	PMC1_IO[19]	PMC1_IO[20]	20
21	PMC1_IO[21]	PMC1_IO[22]	22
23	PMC1_IO[23]	PMC1_IO[24]	24
25	PMC1_IO[25]	PMC1_IO[26]	26
27	PMC1_IO[27]	PMC1_IO[28]	28
29	PMC1_IO[29]	PMC1_IO[30]	30
31	PMC1_IO[31]	PMC1_IO[32]	32
33	PMC1_IO[33]	PMC1_IO[34]	34
35	PMC1_IO[35]	PMC1_IO[36]	36
37	PMC1_IO[37]	PMC1_IO[38]	38
39	PMC1_IO[39]	PMC1_IO[40]	40
41	PMC1_IO[41]	PMC1_IO[42]	42
43	PMC1_IO[43]	PMC1_IO[44]	44
45	PMC1_IO[45]	PMC1_IO[46]	46
47	PMC1_IO[47]	PMC1_IO[48]	48
49	PMC1_IO[49]	PMC1_IO[50]	50
51	PMC1_IO[51]	PMC1_IO[52]	52
53	PMC1_IO[53]	PMC1_IO[54]	54
55	PMC1_IO[55]	PMC1_IO[56]	56
57	PMC1_IO[57]	PMC1_IO[58]	58
59	PMC1_IO[59]	PMC1_IO[60]	60
61	PMC1_IO[61]	PMC1_IO[62]	62
63	PMC1_IO[63]	PMC1_IO[64]	64

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PMC SITE 2: JN1 AND JN2 CONNECTORS

TABLE 2.4: PMC Site 2: Pin Assignments (Jn1 and Jn2)

PMC Site 2: Jn1 32 Bit PCI			
Pin #	**Signal Name**	**Signal Name**	**Pin #**
1	PMC_TCK	-12V	2
3	GND	PMC2_INTA#	4
5	PMC2_INTB#	PMC2_INTC#	6
7	PMC2_BUSMODE1	+5V	8
9	PMC2_INTD#	PMC2_PCIR1	10
11	GND	PMC2_PCIR2	12
13	PMC2_CLK	GND	14
15	GND	PMC2_GNT#	16
17	PMC2_REQ#	+5V	18
19	VIO	AD[31]	20
21	AD[28]	AD[27]	22
23	AD[25]	GND	24
25	GND	C/BE[3]#	26
27	AD[22]	AD[21]	28
29	AD[19]	+5V	30
31	VIO	AD[17]	32
33	PMC2_FRAME#	GND	34
35	GND	PMC2_IRDY#	36
37	PMC2_DEVSEL	+5V	38
39	GND	PMC2_LOCK#	40
41	PMC2_SDONE#	PMC2_SBO#	42
43	PMC2_PAR	GND	44
45	VIO	AD[15]	46
47	AD[12]	AD[11]	48
49	AD[09]	+5V	50
51	GND	C/BE[0]#	52
53	AD[06]	AD[05]	54
55	AD[04]	GND	56
57	VIO	AD[03]	58
59	AD[02]	AD[01]	60
61	AD[00]	+5V	62
63	GND	PMC2_REQ64#	64

PMC Site 2: Jn2 32 Bit PCI			
Pin #	**Signal Name**	**Signal Name**	**Pin #**
1	+12V	PMC_TRST	2
3	PMC_TMS	PMC2_TDO_NC	4
5	PMC_TDI	GND	6
7	GND	PMC2_PCIR5	8
9	PMC2_PCIR3	PMC2_PCIR6	10
11	+3.3V (PMC2_BUSMODE2)	+3.3V	12
13	PMC2_RST#	GND (BUSMODE3)	14
15	+3.3V	GND (BUSMODE4)	16
17	PMC2_PCIR4	GND	18
19	AD[30]	AD[29]	20
21	GND	AD[26]	22
23	AD[24]	+3.3V	24
25	PMC2_IDSEL	AD[23]	26
27	+3.3V	AD[20]	28
29	AD[18]	GND	30
31	AD[16]	C/BE[2]#	32
33	GND	PMC2_PMCR3	34
35	PMC2_TRDY#	+3.3V	36
37	GND	PMC2_STOP#	38
39	PMC2_PERR#	GND	40
41	+3.3V	PMC2_SERR#	42
43	C/BE[1]#	GND	44
45	AD[14]	AD[13]	46
47	GND	AD[10]	48
49	AD[08]	+3.3V	50
51	AD[07]	PMC2_PMCR4	52
53	+3.3V	PMC2_PMCR5	54
55	PMC2_PMCR1	GND	56
57	PMC2_PMCR2	PMC2_PMCR6	58
59	GND	PMC2_PMCR7	60
61	PMC2_ACK64#	+3.3V	62
63	GND	PMC2_PMCR8	64

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PMC SITE 2: JN3 AND JN4 CONNECTORS

TABLE 2.5: PMC Site 2: Pin Assignments (Jn3 and Jn4)

PMC Site 1: Jn3 32 Bit PCI			
Pin #	**Signal Name**	**Signal Name**	**Pin #**
1	PMC2_PCIR7	GND	2
3	GND	C/BE[7]#	4
5	C/BE[6]#	C/BE[5]#	6
7	C/BE[4]#	GND	8
9	VIO	PMC2_PAR64	10
11	AD[63]	AD[62]	12
13	AD[61]	GND	14
15	GND	AD[60]	16
17	AD[59]	AD[58]	18
19	AD[57]	GND	20
21	VIO	AD[56]	22
23	AD[55]	AD[54]	24
25	AD[53]	GND	26
27	GND	AD[52]	28
29	AD[51]	AD[50]	30
31	AD[49]	GND	32
33	GND	AD[48]	34
35	AD[47]	AD[46]	36
37	AD[45]	GND	38
39	VIO	AD[44]	40
41	AD[43]	AD[42	42
43	AD[41]	GND	44
45	GND	AD[40]	46
47	AD[39]	AD[38]	48
49	AD[37]	GND	50
51	GND	AD[36]	52
53	AD[35]	AD[34]	54
55	AD[33]	GND	56
57	VIO	AD[32]	58
59	PMC2_PCIR8	PMC2_PCIR10	60
61	PMC2_PCIR9	GND	62
63	GND	PMC2_PCIR11	64

PMC Site 1: Jn4 32 Bit PCI			
Pin #	**Signal Name**	**Signal Name**	**Pin #**
1	PMC2_IO[1]	PMC2_IO[2]	2
3	PMC2_IO[3]	PMC2_IO[4]	4
5	PMC2_IO[5]	PMC2_IO[6]	6
7	PMC2_IO[7]	PMC2_IO[8]	8
9	PMC2_IO[9]	PMC2_IO[10]	10
11	PMC2_IO[11]	PMC2_IO[12]	12
13	PMC2_IO[13]	PMC2_IO[14]	14
15	PMC2_IO[15]	PMC2_IO[16]	16
17	PMC2_IO[17]	PMC2_IO[18]	18
19	PMC2_IO[19]	PMC2_IO[20]	20
21	PMC2_IO[21]	PMC2_IO[22]	22
23	PMC2_IO[23]	PMC2_IO[24]	24
25	PMC2_IO[25]	PMC2_IO[26]	26
27	PMC2_IO[27]	PMC2_IO[28]	28
29	PMC2_IO[29]	PMC2_IO[30]	30
31	PMC2_IO[31]	PMC2_IO[32]	32
33	PMC2_IO[33]	PMC2_IO[34]	34
35	PMC2_IO[35]	PMC2_IO[36]	36
37	PMC2_IO[37]	PMC2_IO[38]	38
39	PMC2_IO[39]	PMC2_IO[40]	40
41	PMC2_IO[41]	PMC2_IO[42]	42
43	PMC2_IO[43]	PMC2_IO[44]	44
45	PMC2_IO[45]	PMC2_IO[46]	46
47	PMC2_IO[47]	PMC2_IO[48]	48
49	PMC2_IO[49]	PMC2_IO[50]	50
51	PMC2_IO[51]	PMC2_IO[52]	52
53	PMC2_IO[53]	PMC2_IO[54]	54
55	PMC2_IO[55]	PMC2_IO[56]	56
57	PMC2_IO[57]	PMC2_IO[58]	58
59	PMC2_IO[59]	PMC2_IO[60]	60
61	PMC2_IO[61]	PMC2_IO[62]	62
63	PMC2_IO[63]	PMC2_IO[64]	64

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VME P0 CONNECTOR PIN ASSIGNMENTS

The pin assignments for the VME P0 connector are shown in Table 2.6.

TABLE 2.6: VME P0 Connector Pin Assignments

Pin #	A	B	C	D	E	F
1	PMC1_IO[11]	PMC1_IO[10]	PMC1_IO[9]	PMC1_IO[8]	PMC1_IO[7]	GND
2	PMC1_IO[16]	PMC1_IO[15]	PMC1_IO[14]	PMC1_IO[13]	PMC1_IO[12]	GND
3	GND	PMC1_IO[18]	GND	GND	PMC1_IO[17]	GND
4	P0_REQ0# **(See Caution)**	GND	P0_GNT0# **(See Caution)**	P0_CLK0	P0_RST#	GND
5	P0_DEVSEL#	P0_REQ1#	P0_CLK1_NC	GND	P0_INTA#	GND
6	+5V_NC	P0_TRDY#	P0_IRDY#	P0_SERARB	P0_GNT1#	GND
7	P0_TERMDIS	P0_STOP#	P0_PERR#	P0_IDSEL	P0_SERR#	GND
8	CBE[2]	CBE[3]	P0_CLOCKDIS	P0_FRAME#	P0_PAR	GND
9	GND	GND	GND	GND	GND	GND
10	PMC1_IO[4]	PMC1_IO[2]	PMC1_IO[5]	PMC1_IO[3]	PMC1_IO[1]	GND
11	GND	GND	PMC1_IO[6]	GND	GND	GND
12	P0_AD[1]	P0_AD[0]	P0_ARBDIS	P0_CBE[1]	P0_CBE[0]	GND
13	GND	P0_AD[5]	P0_AD[4]	P0_AD[3]	P0_AD[2]	GND
14	P0_AD[11]	P0_AD[8]	P0_AD[9]	P0_AD[6]	P0_AD[7]	GND
15	P0_AD[14]	GND	P0_AD[12]	P0_AD[13]	P0_AD[10]	GND
16	P0_AD[19]	P0_AD[18]	P0_AD[17]	P0_AD[16]	P0_AD[15]	GND
17	P0_AD[22]	P0_AD[23]	P0_AD[20]	P0_AD[21]	GND	GND
18	GND	P0_AD[26]	P0_AD[27]	P0_AD[24]	P0_AD[25]	GND
19	RESERVED	P0_AD[31]	P0_AD[30]	P0_AD[29]	P0_AD[28]	GND

Caution

The signals assigned to P0-A4 and P0-C4 in Table 2.6 have been swapped in this edition of the manual, to accurately reflect the current version of the SVME/DMV-210 hardware. This change was introduced via ECO # 500000000673.

Tip

Table 2.6 shows generic signal names (e.g. PMC1_IO[11]) for the PMC module that may (or may not) be installed in PMC Site 1 on the SVME/DMV-210 Carrier Card. In order to generate a complete and specific VME P0 Connector Pin Assignments table for your combination of PMC module and SVME/DMV-210 Carrier Card, we have developed a pinout configurator application and included it on the Technical Documentation CD-ROM for the OUTREACH™ PCI/PMC Expansion System. It allows you to generate the pin assignments table specific to your product configuration by selecting from a list of standard CWCEC PMC modules. Alternatively, you can load pinout information specific to a third party PMC module or one of your own design, and generate the SVME/DMV-210 VME P0 pin assignments information on that basis. The resulting pin assignments table replaces the generic PMC signal names shown in the above table with signal names specific to the type of PMC module installed in PMC Site 1 on your SVME/DMV-210 carrier card.

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VME P1 CONNECTOR PIN ASSIGNMENTS

The pin assignments for the VME P1 connector are shown in Table 2.7.

TABLE 2.7: Pin Assignments for VME P1 Connector

Pin #	A	B	C	D	Z
1	P1A_NC1	P1B_NC1	P1C_NC1	+5V	P1Z_NC1
2	P1A_NC2	P1B_NC2	P1C_NC2	GND	GND
3	P1A_NC3	P1B_NC3	P1C_NC3	P1D_NC1	P1Z_NC2
4	P1A_NC4	BG0	P1C_NC4	P1D_NC2	GND
5	P1A_NC5	BG0	P1C_NC5	P1D_NC3	P1Z_NC3
6	P1A_NC6	BG1	P1C_NC6	P1D_NC4	GND
7	P1A_NC7	BG1	P1C_NC7	P1D_NC5	P1Z_NC4
8	P1A_NC8	BG2	P1C_NC8	P1D_NC6	GND
9	GND	BG2	GND	P1D_NC7	P1Z_NC5
10	P1A_NC9	BG3	P1C_NC9	P1D_NC8	GND
11	GND	BG3	P1C_NC10	P1D_NC9	P1Z_NC6
12	P1A_NC10	P1B_NC4	P1C_NC11	P1D_NC10	GND
13	P1A_NC11	P1B_NC5	P1C_NC12	P1D_NC11	P1Z_NC7
14	P1A_NC12	P1B_NC6	P1C_NC13	P1D_NC12	GND
15	GND	P1B_NC7	P1C_NC14	P1D_NC13	P1Z_NC8
16	P1A_NC13	P1B_NC8	P1C_NC15	P1D_NC14	GND
17	GND	P1B_NC9	P1C_NC16	P1D_NC15	P1Z_NC9
18	P1A_NC14	P1B_NC10	P1C_NC17	P1D_NC16	GND
19	GND	P1B_NC11	P1C_NC18	P1D_NC17	P1Z_NC10
20	P1A_NC15	GND	P1C_NC19	P1D_NC18	GND
21	IACK	P1B_NC12	P1C_NC20	P1D_NC19	P1Z_NC11
22	IACK	P1B_NC13	P1C_NC21	P1D_NC20	GND
23	P1A_NC18	GND	P1C_NC22	P1D_NC21	P1Z_NC12
24	P1A_NC19	P1B_NC14	P1C_NC23	P1D_NC22	GND
25	P1A_NC20	P1B_NC15	P1C_NC24	P1D_NC23	P1Z_NC13
26	P1A_NC21	P1B_NC16	P1C_NC25	P1D_NC24	GND
27	P1A_NC22	P1B_NC17	P1C_NC26	P1D_NC25	P1Z_NC14
28	P1A_NC23	P1B_NC18	P1C_NC27	P1D_NC26	GND
29	P1A_NC24	P1B_NC19	P1C_NC28	P1D_NC27	P1Z_NC15
30	P1A_NC25	P1B_NC20	P1C_NC29	P1D_NC28	GND
31	-12V	P1B_NC21	+12V	GND	P1Z_NC16
32	+5V	+5V	+5V	+5V	GND

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VME P2 CONNECTOR PIN ASSIGNMENTS

The pin assignments for the VME P2 connector are shown in Table 2.8.

TABLE 2.8: Pin Assignments for VME P2 Connector

Pin #	A	B	C	D	Z
1	PMC2_IO[02]	+5V	PMC2_IO[01]	PMC1_IO[19]	PMC1_IO[20]
2	PMC2_IO[04]	GND	PMC2_IO[03]	PMC1_IO[21]	GND
3	PMC2_IO[06]	NC	PMC2_IO[05]	PMC1_IO[23]	PMC1_IO[22]
4	PMC2_IO[08]	NC	PMC2_IO[07]	PMC1_IO[24]	GND
5	PMC2_IO[10]	NC	PMC2_IO[09]	PMC1_IO[26]	PMC1_IO[25]
6	PMC2_IO[12]	NC	PMC2_IO[11]	PMC1_IO[27]	GND
7	PMC2_IO[14]	NC	PMC2_IO[13]	PMC1_IO[29]	PMC1_IO[28]
8	PMC2_IO[16]	NC	PMC2_IO[15]	PMC1_IO[30]	GND
9	PMC2_IO[18]	NC	PMC2_IO[17]	PMC1_IO[32]	PMC1_IO[31]
10	PMC2_IO[20]	NC	PMC2_IO[19]	PMC1_IO[33]	GND
11	PMC2_IO[22]	NC	PMC2_IO[21]	PMC1_IO[35]	PMC1_IO[34]
12	PMC2_IO[24]	GND	PMC2_IO[23]	PMC1_IO[36]	GND
13	PMC2_IO[26]	+5V	PMC2_IO[25]	PMC1_IO[38]	PMC1_IO[37]
14	PMC2_IO[28]	NC	PMC2_IO[27]	PMC1_IO[39]	GND
15	PMC2_IO[30]	NC	PMC2_IO[29]	PMC1_IO[41]	PMC1_IO[40]
16	PMC2_IO[32]	NC	PMC2_IO[31]	PMC1_IO[42]	GND
17	PMC2_IO[34]	NC	PMC2_IO[33]	PMC1_IO[44]	PMC1_IO[43]
18	PMC2_IO[36]	NC	PMC2_IO[35]	PMC1_IO[45]	GND
19	PMC2_IO[38]	NC	PMC2_IO[37]	PMC1_IO[47]	PMC1_IO[46]
20	PMC2_IO[40]	NC	PMC2_IO[39]	PMC1_IO[48]	GND
21	PMC2_IO[42]	NC	PMC2_IO[41]	PMC1_IO[50]	PMC1_IO[49]
22	PMC2_IO[44]	GND	PMC2_IO[43]	PMC1_IO[51]	GND
23	PMC2_IO[46]	NC	PMC2_IO[45]	PMC1_IO[53]	PMC1_IO[52]
24	PMC2_IO[48]	NC	PMC2_IO[47]	PMC1_IO[54]	GND
25	PMC2_IO[50]	NC	PMC2_IO[49]	PMC1_IO[56]	PMC1_IO[55]
26	PMC2_IO[52]	NC	PMC2_IO[51]	PMC1_IO[57]	GND
27	PMC2_IO[54]	NC	PMC2_IO[53]	PMC1_IO[59]	PMC1_IO[58]
28	PMC2_IO[56]	NC	PMC2_IO[55]	PMC1_IO[60]	GND
29	PMC2_IO[58]	NC	PMC2_IO[57]	PMC1_IO[62]	PMC1_IO[61]
30	PMC2_IO[60]	NC	PMC2_IO[59]	PMC1_IO[63]	GND
31	PMC2_IO[62]	GND	PMC2_IO[61]	GND	PMC1_IO[64]
32	PMC2_IO[64]	+5V	PMC2_IO[63]	+5V	GND

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Tip

Table 2.8 shows generic PMC module signal names (e.g. PMC2_IO[02]) for the PMC modules that may (or may not) be installed in either PMC Site 1 or PMC Site 2 on the SVME/DMV-210 Carrier Card. In order to generate a complete and specific VME P2 Connector Pin Assignments table for your combination of PMC modules and SVME/DMV-210 Carrier Card, we have developed a pinout configurator application and included it on the Technical Documentation CD-ROM for the OUTREACH™ PCI/PMC Expansion System. It allows you to generate the pin assignments table specific to your product configuration by selecting from a list of standard CWCEC PMC modules. Alternatively, you can load pinout information specific to a third party PMC module or one of your own design, and generate the SVME/DMV-210 VME P2 pin assignments table on that basis. The resulting pin assignments table replaces the generic PMC signal names shown in Table 2.8 with signal names specific to the types of PMC modules installed on your SVME/DMV-210 carrier card.

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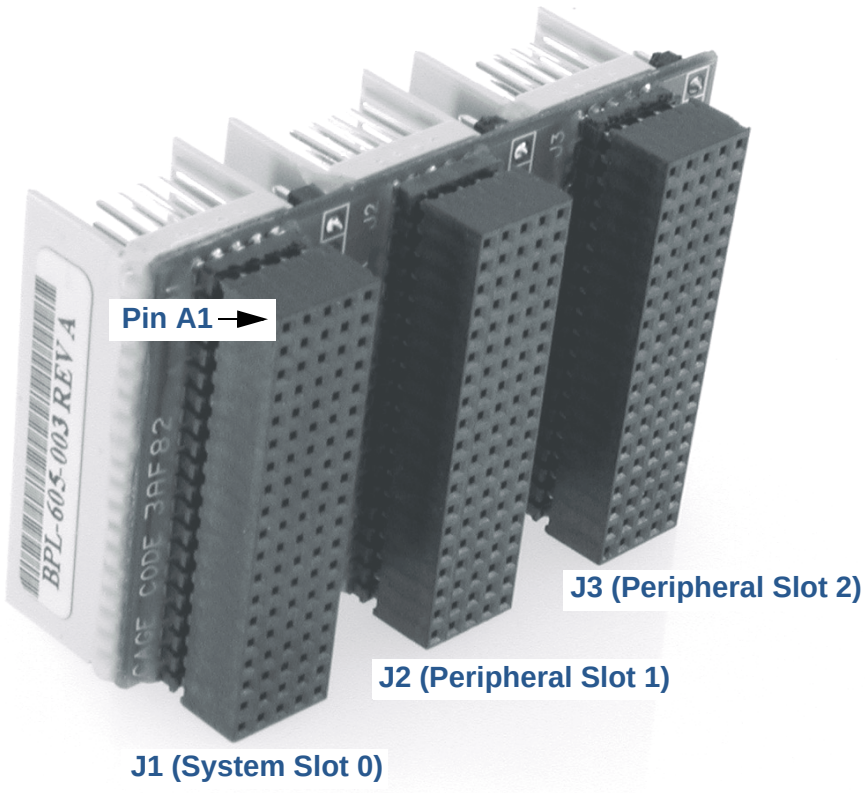
3

PCI-P0 DEVELOPMENT BACKPLANE

GENERAL DESCRIPTION

The PCI-P0 development backplane comes in 2 and 3 slot versions (order numbers BPL-605-002 and BPL-605-003). The slots are labelled from left to right: System Slot 0, Peripheral Slot 1, and Peripheral Slot 2.

FIGURE 3.1: PCI-P0 Development Backplane Slot Locations (3 Slot Version)



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BACKPLANE JUMPER CONFIGURATIONS

Bus arbiter, clock source, and signal termination settings are configured via jumpers on the PCI-P0 Development Backplanes, part numbers BPL-605-002 and BPL-605-003. Refer to Table 3.1 to Table 3.3 for details.

Caution

The additional configurations included here are for reference purposes only. **Adjusting the jumper configuration of your PCI-P0 development backplane may cause your PMC-605 modules to malfunction.**

Note

Some jumpers on the BPL-605-002 and BPL-605-003 are reserved for future use. In particular on the BPL-605-002 jumpers E-10 through E-15 are reserved, while on the BPL-605-003, jumpers E-10, E-11 and E-12, as well as E-22 through E-27 are reserved.

BUS ARBITER JUMPER SETTINGS

Each PCI-P0 system requires one and only one PMC-605 configured as bus arbiter (ARBIS signal connected to Ground). The other PMC-605s should have bus arbitration disabled (ARBIS signal connected to Vcc).

Note

While each PMC-605 is capable of acting as the bus arbiter, the BPL-605-002 and BPL-605-003 backplanes are tracked so that only the System Slot supports a bus arbiter.

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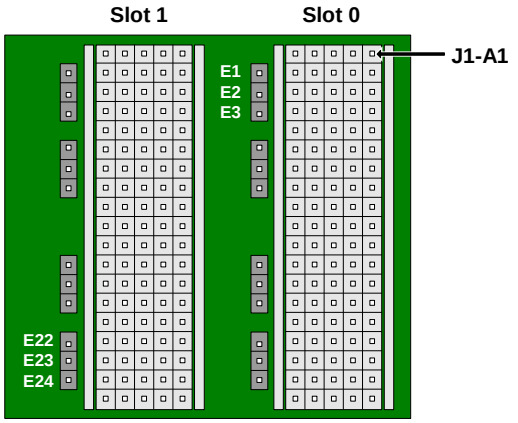
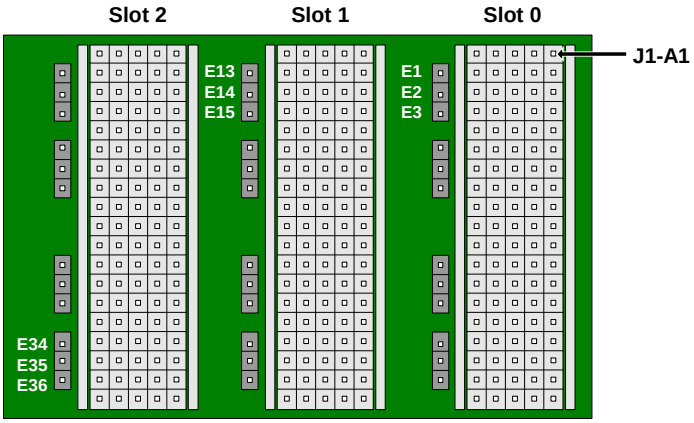
TABLE 3.1: Bus Arbiter Jumper Settings

2 Slot Backplane	3 Slot Backplane
Recommended Setting: Set 605 in System Slot 0 as Arbiter: Slot 0. Connect E2-E3 Slot 1. Connect E22-E23	Recommended Setting: Set 605 in System Slot 0 as Arbiter: Slot 0. Connect E2-E3 Slot 1. Connect E13-E14 Slot 2. Connect E34-E35
Additional Possible Configurations: Set 605 in Peripheral Slot 1 as Arbiter: Slot 0. Connect E1-E2 Slot 1. Connect E23-E24	Additional Possible Configurations: Set 605 in Peripheral Slot 1 as Arbiter: Slot 0. Connect E1-E2 Slot 1. Connect E14-E15 Slot 2. Connect E34-E35 Set 605 in Peripheral Slot 2 as Arbiter: Slot 0. Connect E1-E2 Slot 1. Connect E13-E14 Slot 2. Connect E35-E36

FIGURE 3.2: Bus Arbiter Jumper Locations



Rear View - 2 Slot Backplane
(BPL-605-002)



Rear View - 3 Slot Backplane
(BPL-605-003)

Note

The 95-pin connectors mounted on the opposite side of the above circuit cards plug into the corresponding P0 connectors on the rear of the VME backplane.

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PCI BUS CLOCK JUMPER SETTINGS

Each PCI-P0 system requires one and only one PMC-605 configured to provide a clock source (CLKDIS signal connected to Ground). The other PMC-605s should have clock output disabled (CLKDIS signal connected to Vcc).

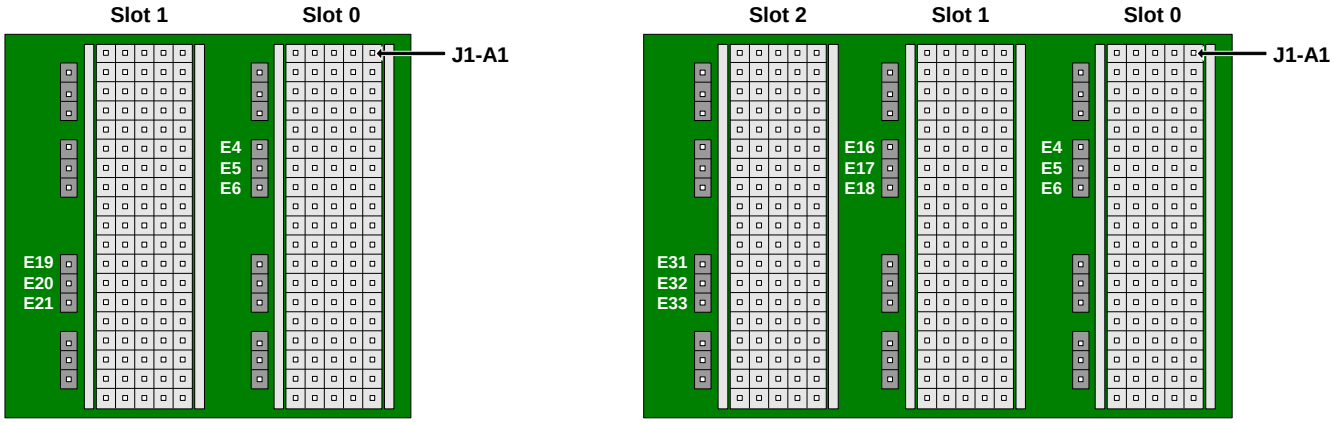
Note

While each PMC-605 card is capable of providing a clock source, the BPL-605-002 and BPL-605-003 backplanes are tracked so that only the System Slot can provide a clock source.

TABLE 3.2: PCI Bus Clock Jumper Settings

2 Slot Backplane	3 Slot Backplane
Recommended Setting: 605 in Slot 0 providing clock source Slot 0. Connect E5-E6 Slot 1. Connect E19-E20	Recommended Setting: 605 in Slot 0 providing clock source Slot 0. Connect E5-E6 Slot 1. Connect E16-E17 Slot 2. Connect E31-E32
Additional Possible Configurations: 605 in Slot 1 providing clock source Slot 0. Connect E4-E5 Slot 1. Connect E20-E21	Additional Possible Configurations: 605 in Slot 1 providing clock source Slot 0. Connect E4-E5 Slot 1. Connect E17-E18 Slot 2. Connect E31-E32 605 in Slot 2 providing clock source Slot 0. Connect E4-E5 Slot 1. Connect E16-E17 Slot 2. Connect E32-E33

FIGURE 3.3: Clock Source Jumper Locations



Rear View - 2 Slot Backplane (BPL-605-002)

Rear View - 3 Slot Backplane (BPL-605-003)

Note

The 95-pin connectors mounted on the opposite side of the above circuit cards plug into the corresponding P0 connectors on the rear of the VME backplane.

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SYSTEM SLOT TERMINATION JUMPER SETTINGS

Each PCI-P0 system requires one and only one PMC-605 configured to terminate PCI bus signals (TERMDIS signal connected to Ground). The other PMC-605s should not be set to terminate bus signals (TERMDIS signal connected to Vcc).

Note

While each PMC-605 is capable of terminating bus signals, the BPL-605-002 and BPL-605-003 backplanes are tracked so that only the System Slot supports signal termination.

TABLE 3.3: System Slot Termination Jumper Settings

2 Slot Backplane	3 Slot Backplane
Recommended Setting: 605 in System Slot 0 terminating bus signals Slot 0. Connect E8-E9 Slot 1. Connect E16-E17	Recommended Setting: 605 in System Slot 0 terminating bus signals Slot 0. Connect E8-E9 Slot 1. Connect E19-E20 Slot 2. Connect E28-E29
Additional Possible Configurations: 605 in Slot 1 terminating bus signals Slot 0. Connect E7-E8 Slot 1. Connect E17-E18	Additional Possible Configurations: 605 in Slot 1 terminating bus signals Slot 0. Connect E7-E8 Slot 1. Connect E20-E21 Slot 2. Connect E28-E29 605 in Slot 2 terminating bus signals Slot 0. Connect E7-E8 Slot 1. Connect E19-E20 Slot 2. Connect E29-E30

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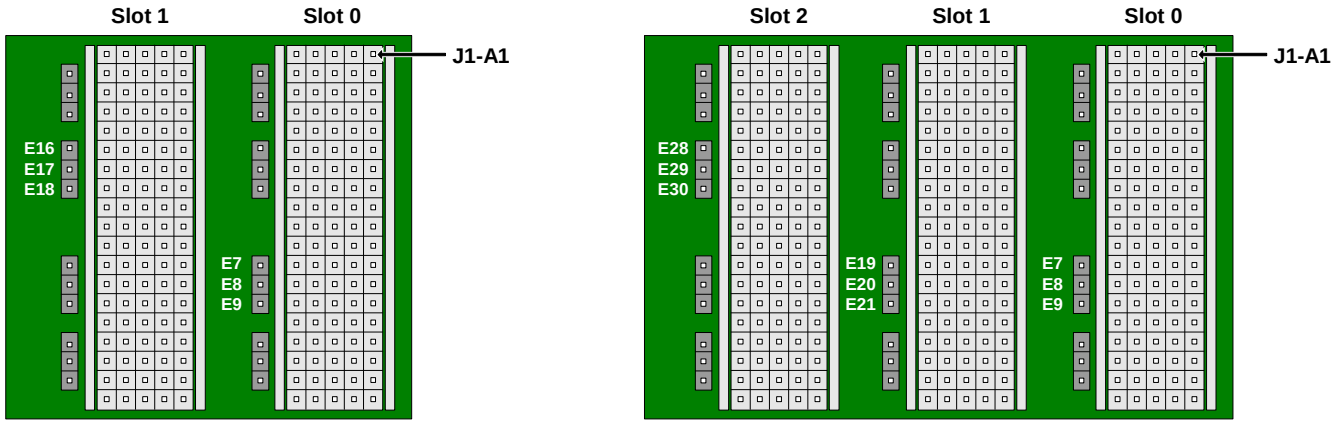
FIGURE 3.4: Bus Termination Jumper Locations



Rear View - 2 Slot Backplane (BPL-605-002)

Rear View - 3 Slot Backplane (BPL-605-003)

Note

The 95-pin connectors mounted on the opposite side of the above circuit cards plug into the corresponding P0 connectors on the rear of the VME backplane.

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PCI-P0 BACKPLANE PIN ASSIGNMENTS

2 SLOT BACKPLANE CONFIGURATION PINS

In a 2 slot backplane, each slot has 4 configuration pins that are independent of other slots. These control: arbiter functions, clock source, line termination and bus arbitration.

TABLE 3.4: 2 Slot Backplane Configuration Pins

Line	Description
Clock Source	The card in System Slot 0 drives a clock out on pins D4 (CLK0) and C5 (CLK1). The peripheral card takes its clock from its D4 pin. System Slot pin C5 connects to the peripheral slot's D4 pin.
Reset	The Reset line is common on pin E4 and should only be driven from Slot 0.
Interrupts	The interrupt line INTA is common on pin E5.
+5 V Rail	The +5 V rail (pin A6) that goes to each P0 connector is isolated for each slot.
Ground	The GND signal is common across all slots.
Request Line	The REQ0 line on the System Slot 0 (pin C4) is driven by the REQ0 line on Peripheral Slot 1 (pin A4).
Grant Line	The GNT0 line on the System Slot 0 (pin A4) drives the GNT0 line on Peripheral Slot 1 (pin C4)

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2 SLOT BACKPLANE SYSTEM SLOT 0 PIN ASSIGNMENTS

The shaded cells in the table below constitute the entire PCI-P0 bus, with some signals originating from the PMC-605 System Slot, while others originate from the Peripheral Slot.

TABLE 3.5: 2 Slot Backplane System Slot 0 Pin Assignments

Pin No.	Row E	Row D	Row C	Row B	Row A
1	basecard signal	basecard signal	basecard signal	basecard signal	basecard signal
2	basecard signal	basecard signal	basecard signal	basecard signal	basecard signal
3	basecard signal	basecard signal	basecard signal	basecard signal	basecard signal
4	RST#	CLK0	REQ0#	GND	GNT0#
5	INTA#	GND	CLK1	REQ1#	DESEL#
6	GNT1#	SERARB_1	IRDY#	TRDY#	+5 V
7	SERR#	IDSEL_1	PERR#	STOP#	TERMDIS_1
8	PAR	FRAME#	CLOCKDIS_1	CBE3	CBE2
9	basecard signal	basecard signal	basecard signal	basecard signal	basecard signal
10	basecard signal	basecard signal	basecard signal	basecard signal	basecard signal
11	basecard signal	basecard signal	basecard signal	basecard signal	basecard signal
12	CBE0	CBE1	ARBDIS_1	AD0	AD1
13	AD2	AD3	AD4	AD5	GND
14	AD7	AD6	AD9	AD8	AD11
15	AD10	AD13	AD12	GND	AD14
16	AD15	AD16	AD17	AD18	AD19
17	GND	AD21	AD20	AD23	AD22
18	AD25	AD24	AD27	AD26	GND
19	AD28	AD29	AD30	AD31	basecard signal

Note

Pins carrying PMC-605 signals are cut short to prevent the PCI-P0 bus from being over-extended when a cable is attached to the development backplane.

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2 SLOT BACKPLANE PERIPHERAL SLOT 1 PIN ASSIGNMENTS

The shaded cells in the table below constitute the entire PCI-P0 bus, with some signals originating from the PMC-605 System Slot, while others originate from the Peripheral Slot.

TABLE 3.6: 2 Slot Backplane Peripheral Slot 1 Pin Assignments

Pin No.	Row E	Row D	Row C	Row B	Row A
1	basecard signal	basecard signal	basecard signal	basecard signal	basecard signal
2	basecard signal	basecard signal	basecard signal	basecard signal	basecard signal
3	basecard signal	basecard signal	basecard signal	basecard signal	basecard signal
4	RST#	CLK0	(REQ0#) GNT0#	GND	(GNT0#) REQ0#
5	INTA#	GND	(CLK1) not connected	(REQ1#) not connected	DESEL#
6	(GNT1#) not connected	SERARB_2	IRDY#	TRDY#	+5 V
7	SERR#	IDSEL_2	PERR#	STOP#	TERMDIS_2
8	PAR	FRAME#	CLOCKDIS_2	CBE3	CBE2
9	basecard signal	basecard signal	basecard signal	basecard signal	basecard signal
10	basecard signal	basecard signal	basecard signal	basecard signal	basecard signal
11	basecard signal	basecard signal	basecard signal	basecard signal	basecard signal
12	CBE0	CBE1	ARBDIS_1	AD0	AD1
13	AD2	AD3	AD4	AD5	GND
14	AD7	AD6	AD9	AD8	AD11
15	AD10	AD13	AD12	GND	AD14
16	AD15	AD16	AD17	AD18	AD19
17	GND	AD21	AD20	AD23	AD22
18	AD25	AD24	AD27	AD26	GND
19	AD28	AD29	AD30	AD31	basecard signal

Note

Pins carrying PMC-605 signals are cut short to prevent the PCI-P0 bus from being over-extended when a cable is attached to the development backplane.

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3 SLOT BACKPLANE CONFIGURATION PINS

In a 3 slot backplane, each slot has 4 configuration pins that are independent of other slots. These control: arbiter functions, clock source, line termination and bus arbitration.

TABLE 3.7: 3 Slot Backplane Configuration Pins

Line	Description
Clock Source	The card in System Slot 0 drives a clock out on pins D4 (CLK0) and C5 (CLK1). System Slot pin C5 connects to Peripheral Slot 1 pin D4, System Slot D4 connects to Peripheral Slot 2 pin D4.
Reset	The Reset line is common on pin E4 and should only be driven from Slot 0.
Interrupts	The interrupt line INTA is common on pin E5.
+5 V Rail	The +5 V rail (pin A6) that goes to each P0 connector is isolated for each slot.
Ground	The GND signal is common across all slots.
Request Line	The REQ0 line on the System Slot (pin C4) is driven by the REQ0 line on Peripheral Slot 1 (pin A4). The REQ1 line on the System Slot (pin B5) is driven by the REQ1 line on Peripheral Slot 2 (pin A4).
Grant Line	The GNT0 line on the System Slot (pin A4) drives GNT0 line on Peripheral Slot 1 (pin C4). The GNT1 line on the System Slot (pin E6) drives the GNT1 line on Peripheral Slot 2 (pin C4).

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3 SLOT BACKPLANE SYSTEM SLOT 0 PIN ASSIGNMENTS

The shaded cells in the table below constitute the entire PCI-P0 bus, with some signals originating from the PMC-605 System Slot, while others originate from the Peripheral Slot.

TABLE 3.8: 3 Slot Backplane System Slot 0

Pin No.	Row E	Row D	Row C	Row B	Row A
1	basecard signal	basecard signal	basecard signal	basecard signal	basecard signal
2	basecard signal	basecard signal	basecard signal	basecard signal	basecard signal
3	basecard signal	basecard signal	basecard signal	basecard signal	basecard signal
4	RST#	CLK0	REQ0#	GND	GNT0#
5	INTA#	GND	CLK1	REQ1#	DESEL#
6	GNT1#	SERARB_1	IRDY#	TRDY#	+5 V
7	SERR#	IDSEL_1	PERR#	STOP#	TERMDIS_1
8	PAR	FRAME#	CLOCKDIS_1	CBE3	CBE2
9	basecard signal	basecard signal	basecard signal	basecard signal	basecard signal
10	basecard signal	basecard signal	basecard signal	basecard signal	basecard signal
11	basecard signal	basecard signal	basecard signal	basecard signal	basecard signal
12	CBE0	CBE1	ARBDIS_1	AD0	AD1
13	AD2	AD3	AD4	AD5	GND
14	AD7	AD6	AD9	AD8	AD11
15	AD10	AD13	AD12	GND	AD14
16	AD15	AD16	AD17	AD18	AD19
17	GND	AD21	AD20	AD23	AD22
18	AD25	AD24	AD27	AD26	GND
19	AD28	AD29	AD30	AD31	basecard signal

Note

Pins carrying PMC-605 signals are cut short to prevent the PCI-P0 bus from being over-extended when a cable is attached to the development backplane.

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3 SLOT BACKPLANE PERIPHERAL SLOT 1 PIN ASSIGNMENTS

The shaded cells in the table below constitute the entire PCI-P0 bus, with some signals originating from the PMC-605 System Slot, while others originate from the Peripheral Slot.

TABLE 3.9: 3 Slot Backplane Peripheral Slot 1

Pin No.	Row E	Row D	Row C	Row B	Row A
1	basecard signal	basecard signal	basecard signal	basecard signal	basecard signal
2	basecard signal	basecard signal	basecard signal	basecard signal	basecard signal
3	basecard signal	basecard signal	basecard signal	basecard signal	basecard signal
4	RST#	CLK0	(REQ0#) GNT0#	GND	(GNT0#) REQ0#
5	INTA#	GND	(CLK1) not connected	(REQ1#) not connected	DESEL#
6	(GNT1#) not connected	SERARB_2	IRDY#	TRDY#	+5 V
7	SERR#	IDSEL_2	PERR#	STOP#	TERMDIS_2
8	PAR	FRAME#	CLOCKDIS_2	CBE3	CBE2
9	basecard signal	basecard signal	basecard signal	basecard signal	basecard signal
10	basecard signal	basecard signal	basecard signal	basecard signal	basecard signal
11	basecard signal	basecard signal	basecard signal	basecard signal	basecard signal
12	CBE0	CBE1	ARBDIS_1	AD0	AD1
13	AD2	AD3	AD4	AD5	GND
14	AD7	AD6	AD9	AD8	AD11
15	AD10	AD13	AD12	GND	AD14
16	AD15	AD16	AD17	AD18	AD19
17	GND	AD21	AD20	AD23	AD22
18	AD25	AD24	AD27	AD26	GND
19	AD28	AD29	AD30	AD31	basecard signal

Note

Pins carrying PMC-605 signals are cut short to prevent the PCI-P0 bus from being over-extended when a cable is attached to the development backplane.

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3 SLOT BACKPLANE PERIPHERAL SLOT 2 PIN ASSIGNMENTS

The shaded cells in the table below constitute the entire PCI-P0 bus, with some signals originating from the PMC-605 System Slot, while others originate from the Peripheral Slot.

TABLE 3.10: 3 Slot Backplane Peripheral Slot 2

Pin No.	Row E	Row D	Row C	Row B	Row A
1	basecard signal	basecard signal	basecard signal	basecard signal	basecard signal
2	basecard signal	basecard signal	basecard signal	basecard signal	basecard signal
3	basecard signal	basecard signal	basecard signal	basecard signal	basecard signal
4	RST#	CLK0	(REQ0#) GNT0#	GND	(GNT0#) REQ0#
5	INTA#	GND	(CLK1) not connected	(REQ1#) not connected	DESEL#
6	(GNT1#) not connected	SERARB_3	IRDY#	TRDY#	+5 V
7	SERR#	IDSEL_3	PERR#	STOP#	TERMDIS_3
8	PAR	FRAME#	CLOCKDIS_3	CBE3	CBE2
9	basecard signal	basecard signal	basecard signal	basecard signal	basecard signal
10	basecard signal	basecard signal	basecard signal	basecard signal	basecard signal
11	basecard signal	basecard signal	basecard signal	basecard signal	basecard signal
12	CBE0	CBE1	ARBDIS_1	AD0	AD1
13	AD2	AD3	AD4	AD5	GND
14	AD7	AD6	AD9	AD8	AD11
15	AD10	AD13	AD12	GND	AD14
16	AD15	AD16	AD17	AD18	AD19
17	GND	AD21	AD20	AD23	AD22
18	AD25	AD24	AD27	AD26	GND
19	AD28	AD29	AD30	AD31	basecard signal

Note

Pins carrying PMC-605 signals are cut short to prevent the PCI-P0 bus from being over-extended when a cable is attached to the development backplane.

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4

SYSTEM INTEGRATION

CONFIGURATION OF THE PCI-P0 BUS

Cross Reference

This section should be read in conjunction with the Intel application note *Getting Started with the 21554 Embedded PCI-to-PCI Bridge*, number 278210-001, downloadable from the Intel website at

http://developer.intel.com.

For a complete list and description of the Foundation Firmware used with the PMC-605, refer to Appendix A of the *Foundation Firmware User's Manual*, document number 808006.

PMC-605 NON-TRANSPARENT PCI-PCI BRIDGING

The PMC-605 utilizes the Intel 21554 PCI-PCI Bridge device. The 21554 is a *non-transparent* PCI-PCI bridge that acts a gateway to other PCI subsystems. It functions as a bridge between two PCI domains: the local PCI bus domain and the PCI-PO bus domain.

The 21554 creates a configuration barrier between the two PCI domains. Standard hierarchical PCI configuration methods using Type 1 configuration transactions cannot be used to access the configuration space of devices on the opposite side of the 21554. Instead, the internal registers of the 21554 such as the Setup Registers, Base Address Registers and Address Translation Registers need to be configured before data can propagate between the two PCI domains.

SVME/DMV-210 TRANSPARENT PCI-PCI BRIDGING

The SVME/DMV-210 uses the Intel 21154 PCI-PCI Bridge device. The 21154 is a *transparent* PCI-PCI bridge, and therefore the internal PCI bus of the SVME/DMV-210 is a transparent extension to the PCI-P0 bus. The 21154 does allow configuration transactions to cross the bridge. In a system with more than one SBC and one or more SVME/DMV-210 cards, only one SBC should have responsibility for configuring the 21154 of the SVME/DMV-210 card.

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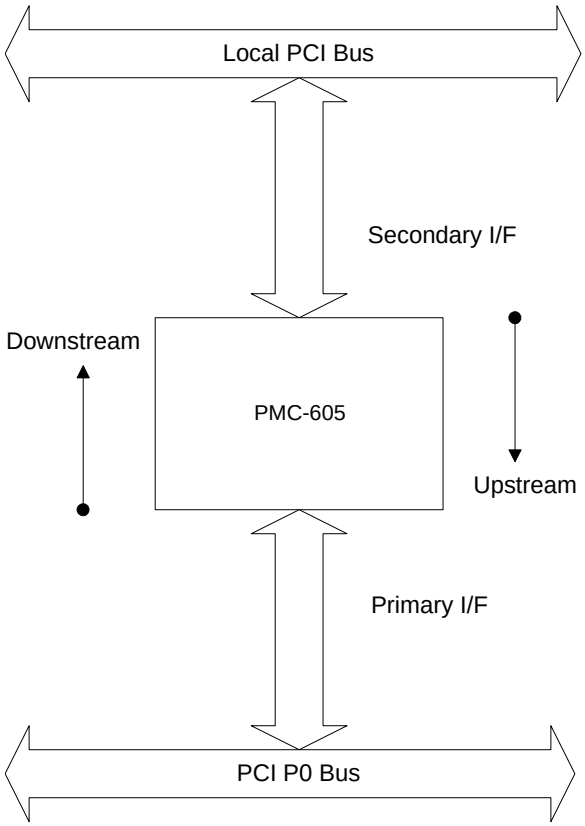
PMC-605 TERMINOLOGY

The PCI *local* bus refers to the host SBC's PCI local bus and is connected to the *secondary* side of the 21554 PCI bridge. The PCI-P0 bus connects to the P0 backplane and to the *primary* side of the 21554. As shown in Figure 4.1, *Upstream* refers to the direction toward the PCI-P0 bus and *Downstream* refers to direction toward the local PCI bus.

FIGURE 4.1: Primary and Secondary PCI Buses



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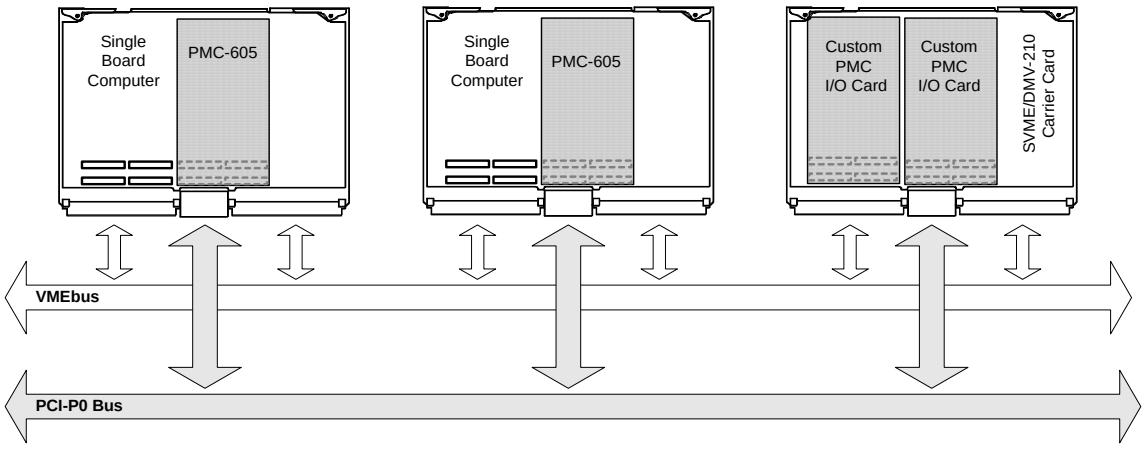
EXAMPLE: TRANSFERRING DATA BETWEEN TWO SBCS

This section provides an example showing how a system containing two adjacent PowerPC Single Board Computers (SBCs) fitted with PMC-605s may be configured to transfer data between the RAM of the two SBCs over the P0 bus. The cards are fitted in slot 1 and 2 of the P0 bus. The card in slot 1 is designated ‘Master’ and the card in slot 2 is designated ‘Slave’.

FIGURE 4.2: Example System



SERIAL EEPROM CONFIGURATION

The PMC-605 is provided with a serial EEPROM to enable configuration of certain registers at power up or reset. This serial EEPROM is programmed at the factory with default values to provide a basic configuration for the 21554 configuration registers. These default values can be changed using the PMC-605 service Pmc605_writeSeeprom.

After the 21554 completes a chip reset, it initiates a serial EEPROM read in order to perform a configuration register preload. Among other things the preload is used to select the size and type of downstream and upstream address windows by preloading the address setup configuration registers.

Note

The serial EEPROM is programmed at the factory with values shown in Table 4.1. Once the registers are preloaded they may be changed by application software simply by writing new values to the appropriate register via the PMC-605 Primary or Secondary Interfaces.

Caution

Do not alter the preload enable bit 7 at address 0. Altering the preload bit will prevent the data being preloaded which in turn prevents the Subvendor ID data being loaded.

Do not alter the Subvendor ID values at PROM address 0x7,8,9 and 0xA. Altering the Subvendor ID will prevent the Foundation Firmware from detecting the PMC-605 and cause the PMC-605 FF/W Services to be disabled.

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TABLE 4.1: Serial EEPROM Factory Default Values

Offset	Data	Description
0	0x80	Preload enable bit 7- **Warning: Do not change this value**
1	0x00	
2	0x00	
3	0x00	
4	0x00	Primary Class code
5	0x80	
6	0x06	
7	0xD4	Subvendor IDs - **Warning: Do not change this value**
8	0xD4	Subvendor IDs - **Warning: Do not change this value**
9	0x05	Subvendor IDs - **Warning: Do not change this value**
A	0x06	Subvendor IDs - **Warning: Do not change this value**
B	0x00	Primary Min GNT, Max LAT
C	0x00	
D	0x00	Secondary Class code
E	0x80	
F	0x06	
10	0x00	Secondary Min GNT, Max LAT
11	0x00	
12	0x00	Downstream Mem0 - CSRs only (set a 4 Kbyte window size for CSRs)
13	0xF0	
14	0xFF	
15	0xFF	
16	0x00	Downstream Mem1 or I/O (set 1 Mbyte memory size window)
17	0x00	
18	0xF0	
19	0xFF	
1A	0x00	Downstream Mem 2 (not used)
1B	0x00	
1C	0x00	
1D	0x00	
1E	0x00	Downstream Mem 3 (not used)
1F	0x00	
20	0x00	
21	0x00	
22	0x00	Downstream Mem 3 Upper 32
23	0x00	
24	0x00	
25	0x00	
26	0x00	Expansion ROM (not used)
27	0x00	
28	0x01	Upstream Mem0 or I/O (Set 1 Kbyte I/O window size)
29	0xFC	

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TABLE 4.1: Serial EEPROM Factory Default Values

Offset	Data	Description
2A	0xFF	
2B	0xFF	
2C	0x00	Upstream Mem1 (set 4 Mbyte memory window size)
2D	0x00	
2E	0xC0	
2F	0xFF	
30	0x00	Chip Control
31	0x00	Clear Primary Lockout bit
32	0x00	Chip Control 1
33	0x00	LUT disable, I20 disable
34	0x00	Arbiter Control not used
35	0x00	
36	0x00	System error disable
37	0x00	
38	0x00	Power management
39	0x00	
3A	0x00	
3B	0x00	
3C	0x00	
3D	0x00	
3E	0x00	
3F	0x00	
40	0x00	
41	0x00	
42	0x00	

Cross Reference

These default values listed above can be changed using the PMC-605 service Pmc605_writeSeeprom. Refer to Appendix A of the *Foundation Firmware User's Manual* (document number 808006) for a complete description of the PMC-605 FF/W Services.

SVME/DMV-179 GPM MAP COMMAND WITH PMC-605 INSTALLED

The following is typical of what you will see when you type "map" at the GPM prompt of your SVME/DMV-179 SBC with a PMC-605 installed:

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```
40000000* map

            Hardware map for the SVME/DMV-179

            Base Addr.     Size      LM Addr.
            ----------  ----------  ----------
          A24:  0x00400000  0x00080000  0x00000000
          A32:  0x40000000  0x07FFF000  0x00000000
            ----------  ----------  ----------
     CFI1-4Mx16:  0xFF000000  0x01000000
     CFI1-4Mx16:  0xFE000000  0x01000000
        DRAM:  0x00000000  0x08000000
       NOVRAM:  0xF4008000  0x00008000
            ----------  ----------  ----------
            ----------  ----------  ----------

          Vendor Device HDR    Config        Memory Space Allocation
Device name   ID     ID   TYPE Base Addr   BAR  PCI Base     Size      Type
----------- ------ ------ ---- ----------  --- ---------- ---------- -------
GT-64130    0x11AB 0x6320 0x00 0x80000000   0  0x00000000           Memory
                                            1  0x01000000           Memory
                                            2  0x1C000000           Memory
                                            3  0xFF000000           Memory
                                            4  0xF0000000           Memory
Universe    0x10E3 0x0000 0x00 0x80003000   0  0xD0001000 0x00001000 Memory
                                            1  0xE0001000 0x00001000 I/O
SYM53C885ET 0x1000 0x0701 0x80 0x80004100   0  0xE0000000 0x00000100 I/O
                                            1  0xD0000000 0x00000100 Memory
SYM53C885SC 0x1000 0x000D 0x80 0x80004000   0  0xE0000100 0x00000100 I/O
                                            1  0xD0000100 0x00000100 Memory
                                            2  0xD0002000 0x00001000 Memory
i21554-BRDG 0x1011 0x0046 0x00 0x80005800   0  0xD0003000 0x00001000 Memory
                                            1  0xE0002000 0x00000100 I/O
                                            2  0xE0002400 0x00000400 I/O
                                            3  0xD0400000 0x00400000 Memory
40000000*
```


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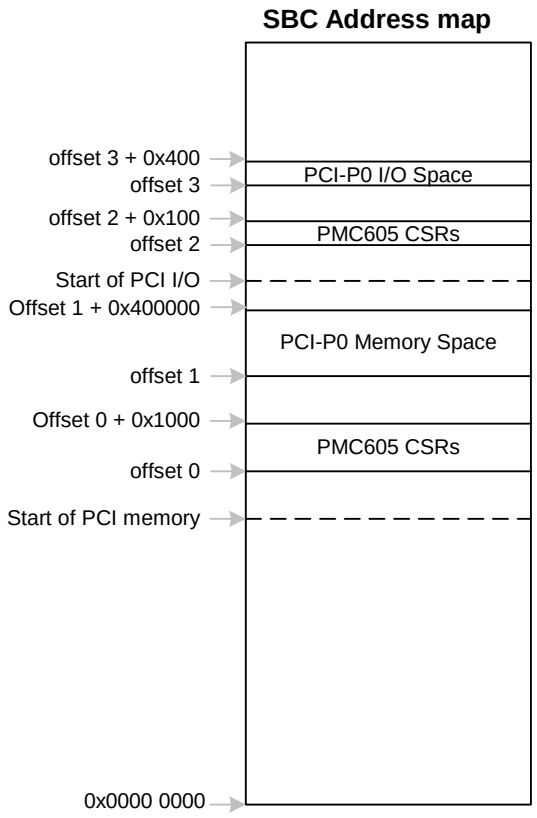
BASE ADDRESS REGISTER INITIALIZATION

Once the setup registers have been configured with the information downloaded from the serial EEPROM, the FF/W initializes the Base Address Registers (BARs) on the local (secondary) PCI bus based on the contents of the corresponding setup registers. The local PCI address map on the SBC then appears as shown in Figure 4.3.

FIGURE 4.3: Local PCI Address Map after BAR Configuration



The base addresses (offsets 0, 1, 2 and 3) are defined by FF/W during initialization and are the values contained in the respective secondary BARs of the 21554. These values can be established by using the CSS function Find_device(). For example:

```
pciDeviceStruct dev;

Find_device(I21554_DEVICE_ID, INTEL_VENDOR_ID,0, &dev);

Offset 0 = (uint32)dev.memBaseAddr[0]      /*Secondary CSR Memory BAR*/
Offset 1 = (uint32)dev.memBaseAddr[1]      /*Upstream Memory 1 BAR*/
Offset 2 = (uint32)dev.ioBaseAddr[0]       /*Secondary CSR I/O BAR*/
Offset 3 = (uint32)dev.ioBaseAddr[1]       /*Upstream I/O BAR*/
```

Alternatively, the Secondary PCI Configuration register defaults can be examined using the GPM command 'PCID'.

For example, to display the contents of the PMC-605 Configuration registers in the PMC slot 1 on a SVME/DMV-179:

At the GPM prompt, type:

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```
pcid 0 b
```

The following message will be displayed:

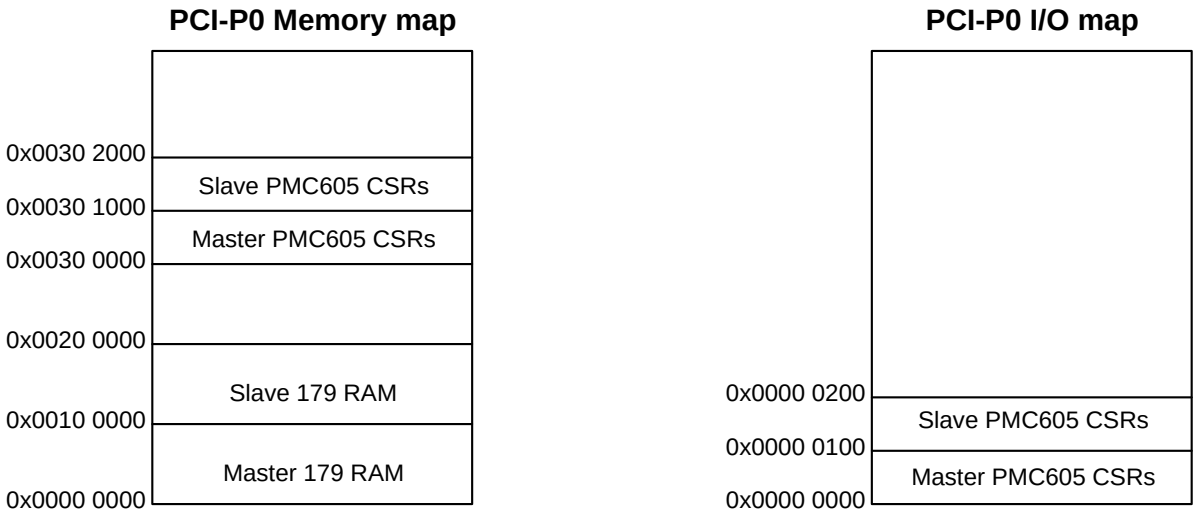
```
40000000* pcid 0 b

Configuration Header for: bus 0x00; device 0x0B; function 0x0
Configuration base address = 0x80005800

device ID =             0x0046    vendor ID =             0x1011
status regiser =        0x0290    command register =      0x0007
class code =            0x06    sub class code =        0x80
programing interface =    0x00    revision ID =           0x01
BIST =                  0x00    header type =           0x00
latency timer =         0x00    cache line size =       0x08
base address 0 =     0xD0003000    base address 1 =     0xE0002001
base address 2 =     0xE0002401    base address 3 =     0xD0400000
base address 4 =     0x00000000    base address 5 =     0x00000000
cardBus CIS pointer = 0x00000000
subsystem ID =          0x0605    subsystem vendor ID =    0xD4D4
expansion ROM Base =  0x00000000
maximum latency =       0x00    minimum grant =         0x00
interupt pin =          0x01    interupt line =         0x00

40000000*
```

PRIMARY BAR CONFIGURATION

Once the Secondary BARs are configured, then the Primary BARs of the PMC-605 must be configured. This can be achieved by any device with access to the PCI-P0 bus configuration space. In this example the host SBC in slot 1 will configure the primary BARs of its own PMC-605 via the PMC-605's Secondary interface configuration space and the Primary BARs of the PMC-605 in slot 2 via the PCI-P0 configuration space.

Figure 4.4 shows one option for the address map for the PCI-P0 bus based on the requirements of the BARs as defined by the Primary Setup registers.

FIGURE 4.4: Example of Address Map based on BAR Requirements



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Configure Master's Primary BARs

To configure the Master's primary BARs, use the CSS function PciConfigWrite(). The parameters to access a PMC-605 on an SBC are as follows:

```
busNo = 0;
deviceNo = 0xB;
functionNo = 0;
RegNo =                    /*Register's Secondary Configuration Space offset*/

/*Set Base address for Master SBC's RAM using Downstream I/O or Memory 1 BAR*/
PciConfigWrite(busNo, deviceNo,functionNo,0x58,0x0,sizeof(uint32));

/*Set Base address for Master's PMC605 CSRs in PCI-P0 memory space*/
PciConfigWrite(busNo, deviceNo,functionNo,0x50,0x300000,sizeof(uint32));

/*Set Base address for Masters's PMC605 CSRs in PCI-P0 I/O space*/
PciConfigWrite(busNo, deviceNo,functionNo,0x54,0x00000001,sizeof(uint32));

/*Enable the Master PMC605 to respond to PCI cycles and ability to act as master on the PCI-P0 bus*/
PciConfigWrite(busNo, deviceNo,functionNo,0x44,0x0007,sizeof(uint16));
```

Configure Slave's Primary BARs

Now the Primary BARS on the slave PMC-605 have to be set using the PMC-605 service Pmc605_pciP0ConfigWrite(). The parameters to access a PMC-605's configuration registers in slot 2 of the P0 bus are as follows:

```
busNo = 0;
deviceNo = 1;
functionNo = 0;
RegNo =                    /*Register's Primary Configuration Space offset*/

/*Set Base address for Slave SBC's RAM using Downstream I/O or Memory 1 BAR*/
Pmc605_pciP0ConfigWrite(busNo, deviceNo,functionNo,0x18,0x100000,sizeof(uint32));

/*Set Base address for Slaves's PMC605 CSRs in PCI-P0 memory space*/
Pmc605_pciP0ConfigWrite (busNo, deviceNo,functionNo,0x10,0x301000,sizeof(uint32));

/*Set Base address for Masters's PMC605 CSRs in PCI-P0 I/O space*/
Pmc605_pciP0ConfigWrite (busNo, deviceNo,functionNo,0x14,0x00000101,sizeof(uint32));

/*Enable the Slave PMC605 to respond to PCI cycles and ability to act as master on the PCI-P0 bus*/
Pmc605_pciP0ConfigWrite (busNo, deviceNo,functionNo,0x04,0x0007,sizeof(uint16));
```

TRANSLATED BASE REGISTER CONFIGURATION

Finally, before any memory transactions are forwarded across the 21554, the translated base registers must be configured.

The translation registers define how the 21554 translates addresses decoded by the 21554's Primary BARs to somewhere pertinent on the secondary side (in this case SBC's RAM) and similarly how the 21554 translates addresses decoded by the 21554's secondary side to a pertinent address on the PCI-P0 bus (Primary side).

In this example each SBC is responsible for configuring its own PMC-605 Translated Base Registers via the secondary interface but this could equally be done by any PCI-P0 bus master via the Primary interface.

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Cross Reference

Your SBC's *Programmer's Reference Manual* provides details of the System Memory Map showing the address of the RAM as seen by a local PCI bus Master.

The parameters to set up the translated base registers are as follows:

/*Set the Downstream I/O or Mem. 1 Translated Base Register to translate addresses decoded by the Primary Downstream I/O or Mem. 1 BAR to RAM addresses starting at 0x100000 on the SBC*/

PciConfigWrite(busNo, deviceNo,functionNo,0x98,0x100000,sizeof(uint32));

/*Set the Upstream I/O or Memory 1 Translated Base Register to translate addresses decoded by the Secondary Upstream I/O or Mem. 1 BAR to PCI-P0 I/O base address 0x0*/

PciConfigWrite(busNo, deviceNo,functionNo,0xA4,0x0,sizeof(uint32));

/*Set the Upstream Memory 1 Translated Base Register to translate addresses decoded by the Secondary Upstream Memory 1 BAR to PCI-P0 memory base address 0x0*/

PciConfigWrite(busNo, deviceNo,functionNo,0xA8,0x0,sizeof(uint32));

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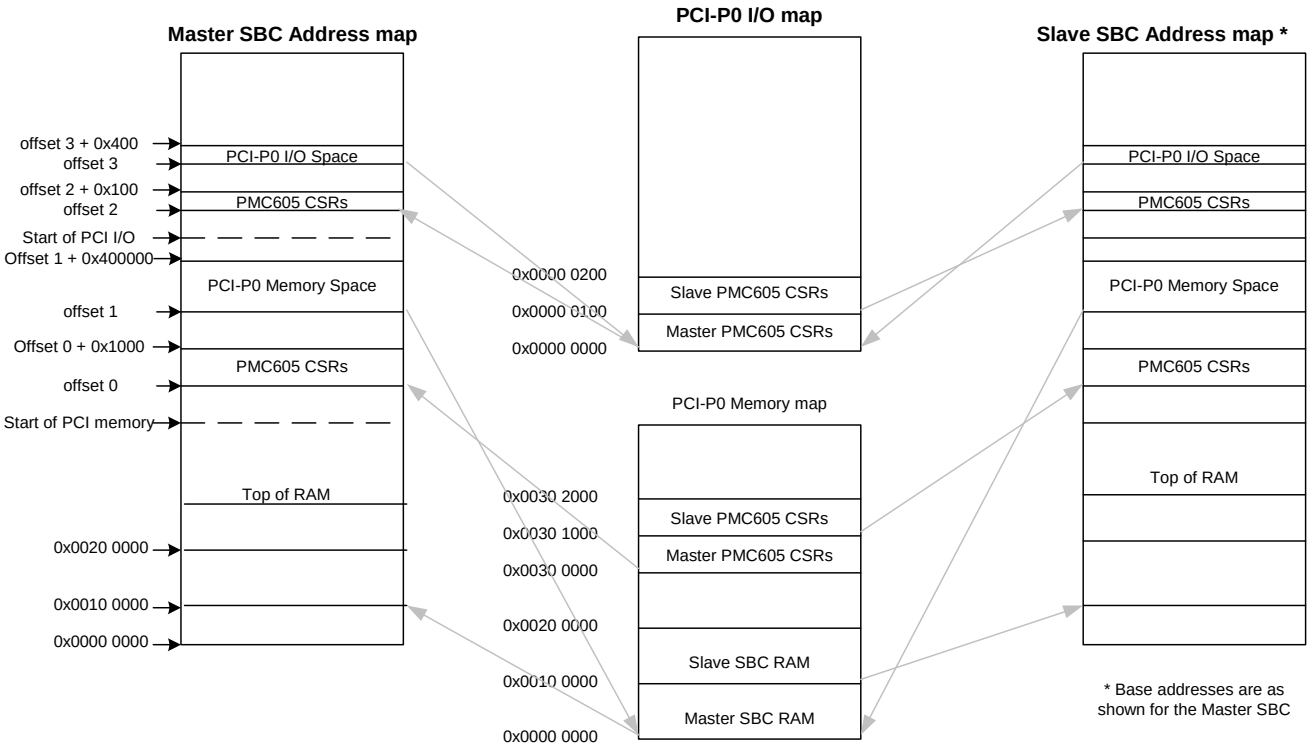
ADDRESS MAP FOR LOCAL PCI AND P0 BUSES

With all the necessary registers now configured the address map for the local PCI and P0 buses appears as shown in Figure 4.5.

FIGURE 4.5: Master-Slave Memory Mappings



TRANSFERRING DATA

For example, to write data to the RAM on the slave SBC the destination address would be offset 1 + 0x100000.

```
uint32 *slave179RamBase = (uint32 *) ((uint32)dev.memBaseAddr[1]  + 0x100000);
uint32  ramData = 0x12345678;

* slave179RamBase = ramData;
```

To write to one of the slave CSRs in PCI-IO space:

```
uint32 *slaveCsrIoBase = (uint32 *) ((uint32)dev.ioBaseAddr[1]  + 0x100);
*slaveCsrIoBase = regData;
```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PCI-P0 CONFIGURATION SPACE ADDRESSING

Table 4.2 shows the address map for the PCI-P0 Configuration Space.

TABLE 4.2: PCI-P0 Configuration Space Address Map

PCI-P0 Slot No.	Configuration Space Address	Device Number
1	0x800000000	0
2	0x400000000	1
3	0x200000000	2
4	0x100000000	3

PCI-P0 slots are numbered from left to right when viewed from the front of the chassis. That is, slot 1 is the left-most slot in the PCI-P0 backplane. The address bit set to one represents the PCI IDSEL# signal.

For configuration Type 0 cycles, the upper 21 address bits of the configuration address select the slot and the lower 11 bits determine the function number of the device and register offset within that function for the selected slot. Refer to the *PCI specification 2.2* for an explanation of Type 0 and 1 configuration cycles.

ADDRESSING EXAMPLE

Suppose you wish to read the Primary CSR and Downstream Memory 0 Base Address Register (BAR) on the PMC-605 in slot 2. Using the PMC-605 service Pmc605_pciPoConfigRead, you would construct the address as follows:

```
#include pmc605.h
#include dy4std.h

:
uint32 busNo   = 0;
uint32 deviceNo = 1;
uint32 funcNo = 0;
```


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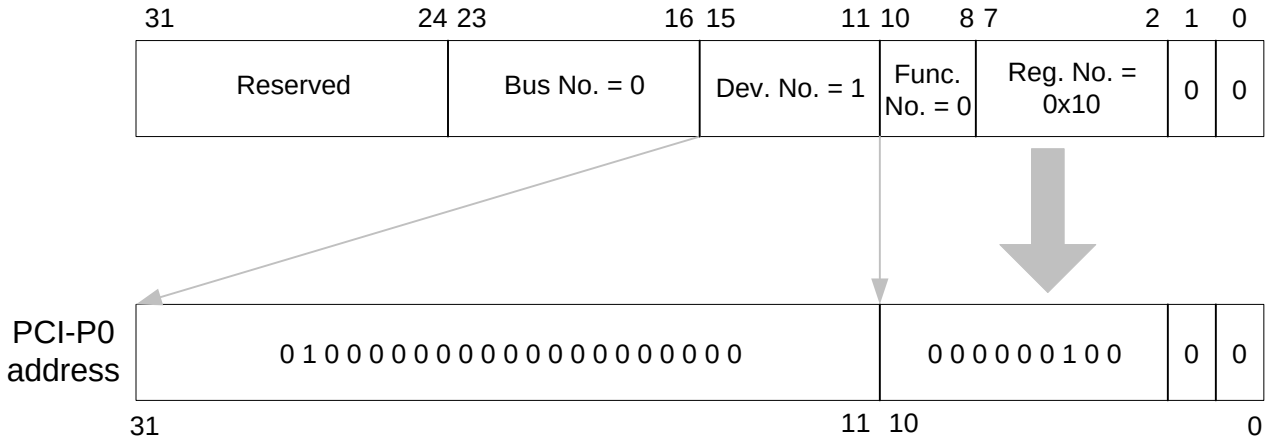
```
uint32 regData;
uint32 regOffset = 0x10;

regData= Pmc605_pciP0ConfigRead(busNo,deviceNo,funcNo,regOffset,sizeof(uint32));
```

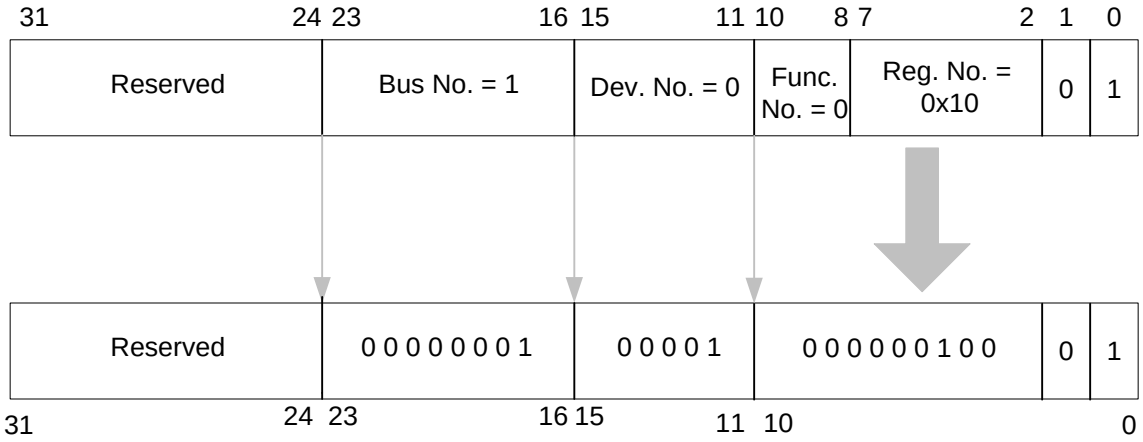
The above code translates to a PCI-P0 address as shown in Figure 4.6.

FIGURE 4.6: Type 0 Configuration Cycle Example



In order to generate a Type 1 configuration cycle to access configuration space on a PCI bus on the downstream side of a PCI to PCI bridge other than a PMC-605, the bus number must be greater than zero. In this instance the values are passed straight through to the PCI-P0 bus as follows:

FIGURE 4.7: Type 1 Configuration Cycle Example



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A

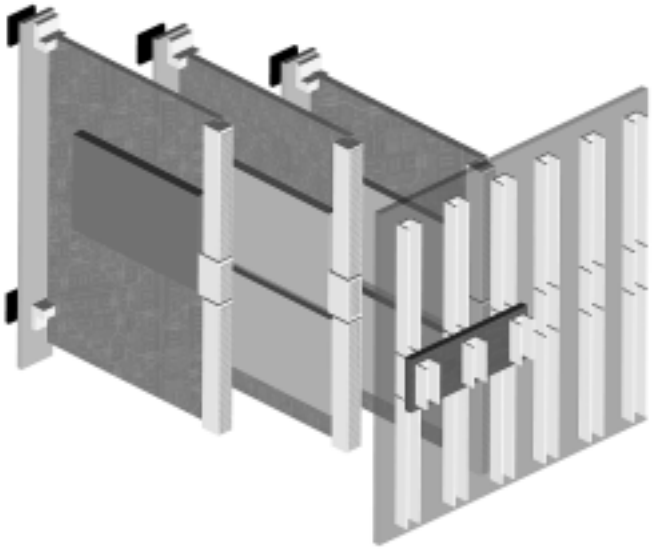
INSTALLATION INSTRUCTIONS

INSTALLATION OVERVIEW

This appendix explains how to install and configure the Outreach Expansion System. The Outreach Expansion System consists of:

- one or more Single Board Computers, each equipped with a PMC-605 module
- one or more SVME/DMV-210 Carrier Cards, each equipped with one or two PMC modules
- one CWCEC PCI-P0 development backplane (identified as either BPL-605-002 or BPL-605-003).
- one standard VME development chassis.

FIGURE A.1: Outreach PCI/PMC Expansion System



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UNPACK CARDS

The cards use components that are sensitive to electrostatic discharges. They must be kept in their conductive package until just before the installation begins.

Caution

Remove the cards from their protective package only at a grounded workstation while wearing an approved grounding wrist strap. Avoid touching any metal contacts on the cards; static discharge can damage integrated circuits.

CONFIGURE CARDS AND PCI-P0 DEVELOPMENT BACKPLANE

Refer to your SBC's *Getting Started Manual* for information selecting jumper settings and configuring your SBCs.

The PMC-605 and the SVME/DMV-210 have no user-definable jumper settings. Configuration is done via the PCI-P0 development backplane.

Cross Reference

The PCI-P0 development backplane (identified as either BPL-605-002 or BPL-605-003) has jumper settings that configure the bus arbiter, the arbitration scheme, the system clock, and the system controller functions. Refer to *Chapter 3* for information on modifying the jumper settings.

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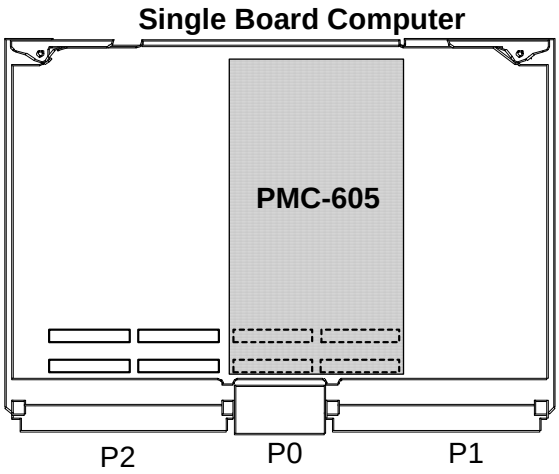
INSTALL PMC-605 ON BASECARD

The PMC-605 should only be installed on an SBC in the PMC slot that routes the PMC-605's P4 connector to the SBC's P0 connector. The PMC-605 will not operate correctly if installed in a different basecard PMC slot position.

FIGURE A.2: PMC Site Location



Cross Reference

In most cases, the PMC-605 will have already been mounted on the basecard at the factory to ensure proper mechanical and thermal mating connections. If necessary, refer to the Application Note *PMC Module Mounting Instructions*, document 808335, for information about installing your PMC-605 on the basecard.

INSERT CARDS IN CHASSIS

Warning

Turn the power off before inserting or removing cards from the VME chassis. Failure to do so could damage the card circuitry or cause personal injury.

About Card Insertion Force

Many SBCs employ 160-pin, 5 row connectors for the P1 and P2 interfaces. Proper mating of these connectors with the VME backplane requires a significant amount of insertion force. Use extra care when aligning and inserting your SBCs into your chassis, to ensure that a secure mechanical and electrical connection is made between the cards and the backplane mating connectors.

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Choosing Slot Locations

Insert the first SBC with PMC-605 card in Slot 1, the left-most slot in the VME chassis, if you want it to be the VMEbus System Controller (SYSCON). If you intend to use another card as the SYSCON, place the SBC with PMC-605 in the left-most unoccupied slot. All VME cards should be installed in adjacent slots; leaving empty slots may cause problems with interrupts and Bus Grant signals.

Insert the additional SBC with PMC-605 cards in the immediately adjacent slots.

If you have a specific SBC with PMC-605 card that you wish to use as the PCI-P0 System Controller, make sure that it is installed to the left of the other cards equipped with PMC-605 cards.

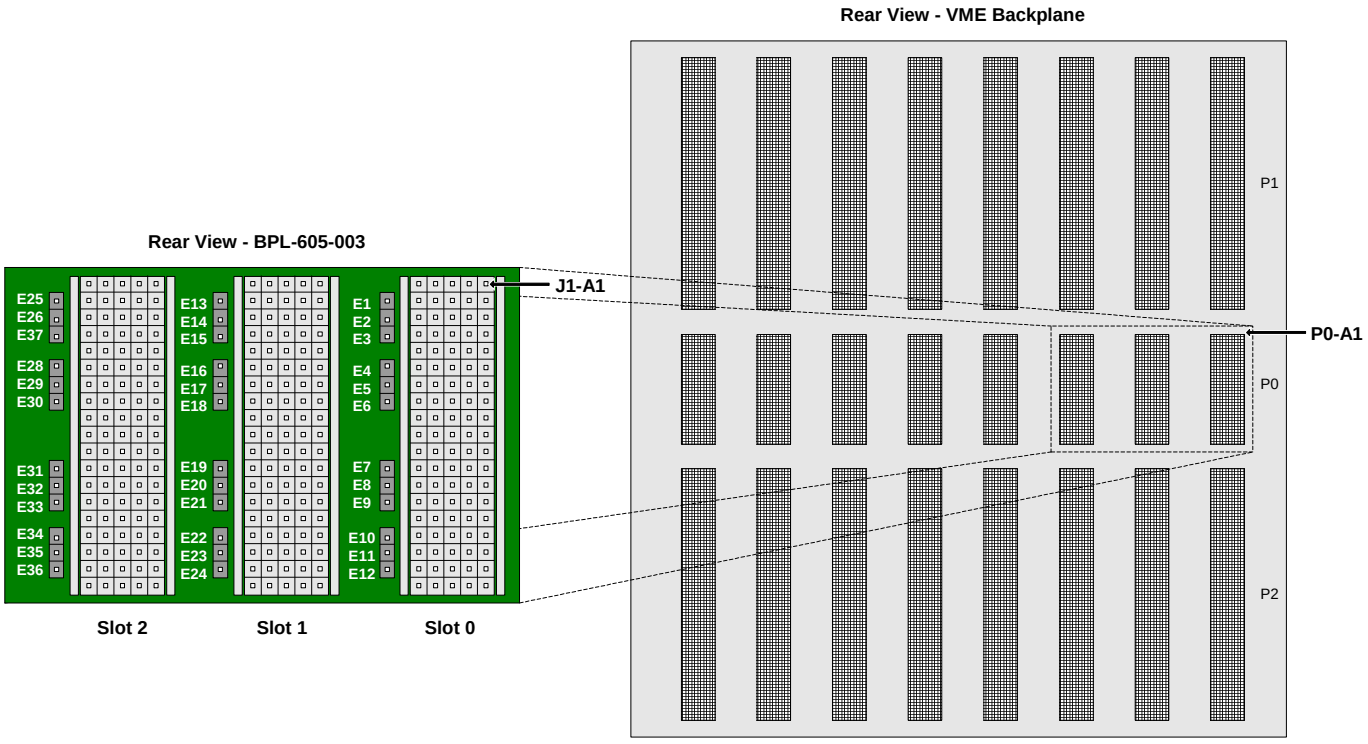
ATTACH THE PCI-P0 DEVELOPMENT BACKPLANE

Attach the PCI-P0 development backplane (either the BPL-605-002 or the BPL-605-003) to the back of the VME backplane. Depending on your system, your PCI-P0 development backplane may support 2 or 3 slots.

Caution

Be careful not to bend any pins when attaching the PCI-P0 development backplane and make sure that it is correctly oriented. The A1 pin is indicated on each of the PCI-P0 development backplane's male connectors. Each A1 pin should mate with the A1 pins on the VME backplane. Refer to Figure A.3 for the correct orientation.

FIGURE A.3: PCI-P0 Backplane Installation



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CONNECT BASECARD TO TERMINAL

To connect the SBC to a terminal via the P0 connector, attach the SBC's P0 cable to the P0 connector on the back of the PCI-P0 backplane.

Cross Reference

For information on additional ways to connect an SBC to a terminal (i.e. using the front panel or P2 connector), refer to the SBC's *Getting Started Manual*.

Terminal Settings

Use the following settings for your terminal emulation software: 9600 baud, 8 data bits, no parity, 1 stop bit.

APPLY POWER

Power on the VME chassis. The SBC will power on and run its internal diagnostics (which includes diagnostics for the PMC-605). The LED on the PMC-605 will initially be illuminated. When the PMC-605 is successfully initialized and its diagnostics passed by FF/W, the LED is extinguished.

Cross Reference

Refer to the *Getting Started Manual* for your SBC for information about applying power, boot sequences, internal diagnostic routines, LED activity, and troubleshooting information.

DISPLAY INITIAL SCREEN MESSAGE

After bootup, control is typically transferred to the General Purpose Monitor (GPM). Pressing any key on the keyboard will inform the GPM that I/O data is being received from the serial data port. The GPM will then display a sign-on message similar to the following:

```
SVME-179 PowerPC 750 General Purpose Monitor, Version 8.0
(c) CWCEC Systems Inc.
Type ? for help
40000000*
```

The last line is the initial prompt which shows the VMEbus base address of the card. In this example the base address is 4000 0000h. Type '?' at the prompt to display the help screen for the GPM.

Cross Reference

For more detailed information on using the GPM, refer to the *V8 Foundation Firmware User's Manual* (808006).

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INSTALL BSP

Cross Reference

Once the hardware is correctly configured and installed in the chassis, the next step is to install the host card's board support package software. See the *BSP Software User's Manual* for more information.

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